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CONTENTS

	PAGE
Editorials	1153
Letters to the Editor	1158
Publications Received	1159
The Scrap Heap	1160
Overseas Railway Affairs	1161
Rebuilding the Moffat Railroad, U.S.A.	1163
Divisional Administration on French State Railways ..	1165
Road Transport Section	1167
The Federated Malay States Railways	1181
Railway News Section	1183
Personal	1183
Legal and Official Notices	1190
Railway Share Market	1192

In consequence of Christmas, next week's issue of THE RAILWAY GAZETTE will be published on Tuesday, December 21, three days earlier than usual

The Scottish Railway Collision

ONCE again the exception of a dramatic railway accident proves the rule of railway safety. In the darkness of last Friday afternoon the L.N.E.R. express which left Waverley station, Edinburgh, at 4.3 p.m. for Glasgow, ran into the rear of a Dundee train due in Glasgow at 4.51 which had been stationary for several minutes near Castlecary station. Much damage was done to the rear of the Dundee train and the front part of that from Edinburgh, and 35 persons lost their lives. This is the highest death roll in a British railway accident since the Gretna disaster of 1915. Only two days before there had been a debate in the House of Lords about the terrible death roll of our roads, amounting to some 6,000 a year, compared to an average on the railways from 1925 to 1935 of only 326 a year, including passengers and employees. We have no information yet as to whether the driver of the Edinburgh train missed his signals, or the signals themselves gave a wrong indication. Either circumstance is extremely rare. The former could be completely avoided only by automatic train control, and a general use of track circuiting would remove the risk of the latter. The extent and nature of the wreckage has, of course, again raised the question of wooden-bodied *versus* all-metal rolling stock, which, like that of A.T.C., is mainly one of cost. Given unlimited funds there is no doubt that

the present high standard of safety on the railways could be raised still further, just as the standard of safety on the roads could be enhanced enormously if money were no object. With the means at their disposal, however, the railways are constantly undertaking improvements that do in fact still further promote safe travel.

* * * *

President Roosevelt and the U.S. Railways

The importance of the United States railway position was clearly demonstrated when President Roosevelt made it the subject of his address at a press conference at the White House on December 10. Discussing the depressed condition of the railways generally, he emphatically declared that though he wished to avoid Government ownership, drastic steps would have to be taken to adjust their financial position. Railway receiverships could not, he pointed out, continue without such adjustment, and therefore the sooner a final decision upon freight rates was reached the better. He announced that he had discussed the question of Reconstruction Finance Corporation loans, but he warned his audience that they would be small and made only temporarily to a few railways pending the result of the freight rate case. The President said there was no intention of appointing a new Federal Co-ordinator of Transport. He went on to express the opinion that, in the absence of a specific or definite plan by the administration for dealing with the problem, the Interstate Commerce Commission should prepare a comprehensive scheme to preserve the solvency, private management and ownership of the railways. This announcement in general, and in particular its indication of policy favouring the retention of private as opposed to Government ownership, is of unusual importance at a time when another great republic is on the point of seeking a cure for similar ailments in the introduction of a national railway system.

* * * *

The Week's Traffics

The returns for the past working week show a combined increase for the four main-line companies of £132,000 as compared with the corresponding period of last year. To this figure coal contributed £65,500, passengers £34,000, and merchandise £32,500. The combined total receipts for the 49 weeks are now £154,628,000, an increase of £6,616,000. Southern Railway merchandise traffic which has shown gains during the past few weeks has fallen £3,500, making the total decrease so far £38,000.

	49th Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	%
L.M.S.R. ..	+ 15,000	+ 20,000	+ 34,000	+ 69,000	+ 2,545,000	+ 4.23
L.N.E.R. ..	+ 10,000	+ 7,000	+ 23,000	+ 40,000	+ 2,141,000	+ 4.91
G.W.R. ..	+ 3,000	+ 9,000	+ 8,000	+ 20,000	+ 1,250,000	+ 5.12
S.R. ..	+ 6,000	- 2,500	+ 500	+ 3,000	+ 680,000	+ 3.45

London Transport receipts for the past week (before pooling with the main-line railways) amounted to £570,800, an increase of £5,900. Great Northern Railway (Ireland) traffics have decreased £300 and Great Southern £4,032, making the respective aggregate decreases £2,800 and £22,378.

* * * *

L.N.E.R. Abolishing Second Class

It was officially announced on Monday night that second class accommodation will be abolished by the L.N.E.R. on January 1 on its London suburban services working in the Great Eastern and Great Northern districts. This step, which is being taken preparatory to the electrification of certain lines involved, represents the completion (with the exception of boat trains) of a process begun in

1875 by the old Midland Railway. In early years the social condition of the country required four or five different classes, and the lowest class accommodation was often somewhat spartan. Legislation resulted in the provision of closed carriages and daily trains at "parliamentary" fares, but it was not until 1872 that the Midland Railway made all its trains available for third class passengers. Other railways followed, but the pace set by the old Midland in abolishing second class accommodation some three years later caused much perturbation among the other railway companies, and it was only gradually that second class began to disappear. The Great Central followed in 1892, the North Eastern in 1899, the Great Western in 1910, and the Lancashire & Yorkshire in 1911; second class disappeared from the Scottish lines in 1894. In the London area second class facilities have been retained by the L.N.E.R. very largely as a special class for season-ticket holders and one result of the change on January 1 will be that third class season tickets are to be issued in the Great Eastern London suburban districts between all stations where those facilities do not exist today. The rates charged for such tickets will be generally less than the current second class rates excepting where the existing second class season tickets are charged on an unusually low basis.

* * * *

Overseas Railway Traffics

With a further addition in the past fortnight of £17,020 to its aggregate receipts, the Buenos Ayres Great Southern Railway retains almost unchanged the rate of progress noted in our issue of December 3. The Central Argentine decrease on the aggregate is now £47,282 greater than in the twenty-second week, and the Buenos Ayres Western has fallen back by £8,256 compared with its position a fortnight ago.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
		£	£	£	£
Buenos Ayres & Pacific ..	24th	78,164	- 9,508	1,877,483	+ 51,882
Buenos Ayres Great Southern ..	24th	139,330	+ 10,006	2,946,464	+ 229,944
Buenos Ayres Western ..	24th	46,526	+ 1,822	1,088,152	+ 95,393
Central Argentine ..	24th	124,302	- 23,572	3,022,317	- 286,020
Canadian Pacific ..	49th	571,200	+ 10,000	27,136,000	+ 1,312,800
Bombay, Baroda & Central India	36th	243,225	- 34,275	6,007,125	+ 321,300

Canadian Pacific aggregate figures have improved by a further £92,600 in their comparison with 1936.

* * * *

Rail Service in Planned Cities

In a paper entitled "The Form and Function of the Railway in the Cities of the Future" read before the Permanent Way Institution (London) on December 8, Mr. Roy V. Hughes presented a view, based on logical ideals, of how the railways should serve the commercial, industrial, and social needs of the communities of planned cities. Emphasising the fact that his address was in the nature of a convenient collection and review of a number of well known facts and theories, after elaborating each of these, he summarised them as follow: Different classes of traffic should be segregated as the main railway lines enter the urban areas of cities. On the passenger side, the long-distance passenger station should be situated just outside the commercial centre of the city, which would however, be fully penetrated by local trains. There should also be a subsidiary station serving the city airport. The main and local lines should be planned as complementary networks, properly connected but in no way competitive. On the freight side the cities of the future would have industrial estates, segregated from the residential area and served by a system of sidings and by a suburban passenger railway. There would be a central goods station, and rail-connected wholesale markets adjacent to the central area of the city. Just outside the built-up area would be

a goods belt line with marshalling yards, and goods and mineral stations in each group of suburbs. Outside the city too, complicated junctions would be gathered into compact groups, so that only one main line traversed the city, with little breaking up of the street systems. Mr. Hughes expressed these and other features of his railway plan as "somewhat academic" in view of the fact that the town planner never has the task of planning and building a city on a virgin site. Perhaps he will in the future, though. A diagrammatic representation of the gist of Mr. Hughes's scheme appears on page 1187.

* * * *

Belgian King in Train Cinema

As the L.N.E.R. London to Leeds express ran through Hadley tunnel the other day, H.M. King Leopold of the Belgians paid his shilling, the regular price of admission, and entered the Pathé cinema car. The King was accompanied by the Queen Mother, the Duke of Portland, the Count de Grunne, Chamberlain to the Queen Mother, and the Countess de Baillet Latour, her Lady-in-Waiting. His Majesty saw the Pathé Gazette and was considerably surprised when an item appeared showing him on a recent visit to this country inspecting a regiment of which he is Colonel-in-Chief. He was delighted and turning to his mother exclaimed, "Did you see me just then?" It will be recalled that the cinema car was inaugurated over two years ago and was officially declared open by Mr. J. H. Thomas. Some 12,000 performances have been given to date, but this marks the first occasion on which a king and queen have become its patrons, although many celebrities have spent an interesting time in the car, including the Princess Royal and the Duke and Duchess of Kent. Non-inflammable films are used in a special type of projector, known as the Bifograph, which has a particularly wide range of sound. King Leopold expressed great interest in the fact that, although the train at times travels at 80 m.p.h., there is a notable absence of vibration and exterior noises.

* * * *

The Art of Administration

The best work is done by the person who takes a joy in doing it. The mature artist needs no supervision, indeed can tolerate none. He is his own taskmaster. In development to maturity, the less supervision the fuller the development. It is an error to suppose that artists are only those who paint pictures or carve statues or compose music. Administration is an art too, but all too few administrators are mature artists. Many, forced by the existing economic system into niches they do not fit, can never give of their best. But in any case, it is a sound working principle to specify results required and leave the selection of method so far as possible to the party made responsible for producing the results. Success in the art of administration depends upon respect of this principle, which involves the judicious delegation of authority and the recognition of individual responsibility. One of the advantages of small organisations, such as most of the British railways before the amalgamations, is that centralisation, with its dead-hand effect, has little scope; and the only hope for the consumer in an age of vast monopolistic institutions is that, within the monopoly, authority is widely delegated, and the individual made responsible for results. It is finally for the consumers as a body to see that their institutions serve to supply their wants, but the responsible administrators of those institutions should anticipate requirements. An important attempt to fulfil these principles of good administration on the French State Railways is given on page 1165 of this issue.

Southern Railway Non-Stop Relief Trains

While the elimination of intermediate stops by Southern Railway Christmas relief trains does not involve such long non-stop runs as those on the L.N.E.R. announced in our issue of November 26, this method of equalising loads will considerably enhance the normal number of first-stop Bournemouth expresses on Christmas Eve. Relief portions of the regular 12.30, 3.30, and 6.30 p.m. Bournemouth trains will run to Bournemouth non-stop, while the daily non-stop schedule of the 4.30 p.m. will be duplicated, making five such runs in all. The three or four portions of the various trains—the first calling at one or no intermediate stations, and the remainder dividing between them the service provided by the normal timetable—will follow each other at approximately five-minute intervals. Such spacing of relief trains is also Southern Railway practice in increasing what is normally a regular-interval service. As was explained by Mr. E. J. Missenden, Superintendent of Operation, Southern Railway, in his contribution to the discussion on Mr. V. M. Barrington-Ward's paper to the Institute of Transport on "Modern Developments in Railway Operating Practice" (reported in our issue of November 12), this is a feature of the summer Saturday timetables of the Portsmouth electric service. In this way the intervals between expresses in which trains serving intermediate points may run are not unduly reduced.

* * * *

Modern Signalling in China

The extent to which modern signalling equipment has been installed on some Chinese railways is well demonstrated in an interesting article in the *Quarterly Review of Chinese Railways* for July by Mr. H. C. Wang, formerly Signal Engineer to the Peiping-Liaoning Railway, a summary of which appeared on p. 1030 last week. Mr. Wang writes: "Signalling, like any other profession, requires the service of trained men. In medicine every patient must have individual diagnosis and treatment. Patent medicines that claim to cure all diseases are nothing but fakes. What is true of medicine is also true of signalling. All the signal schemes which have been here described are therefore not meant for wholesale adoption without competent counsel. The key to success in any signal system of note depends solely upon its congruity with the historical background, traffic conditions, workshop facilities and other factors, economical, physical, and personal. Locks of different patterns require indispensably keys of different designs." We agree with this view. The test of good signal engineering is the degree to which it accords with the general principles propounded by Mr. Wang, and gives the most efficient results—operating, technical and financial—obtainable in any given set of circumstances; to weigh all the considerations thereby involved requires a trained man. The P.-L.R. is now entirely in Japanese hands, being partly in Manchukuo and partly along their first line of advance into China during present hostilities.

* * * *

Single Line Token-Exchange on the L.M.S.R. in Scotland

The different conditions under which trains pass from one section of single line railway to another afford a striking contrast between the primitive and the scientific in railway operation. Drawing attention to this, *On Time*, the journal of the L.M.S.R. Operating Department, mentions the very appreciable saving in train time which the use of mechanical token exchanging apparatus permits in comparison with the hand method. This factor is one of

particular importance in relation to punctual running on the L.M.S.R. Northern Division, where there are about 930 miles of single line worked on the electric token block system; nearly 538 miles of this total are equipped with automatic exchange apparatus, as follow:—Manson's apparatus: On the former Highland Railway, about 340 miles, with 154 exchange posts; on the Callender and Oban line, about 78 miles, with 34 exchange posts; on the Stranraer and Castle Douglas line, about 57 miles, with 23 exchange posts. Bryson's apparatus: On the former Glasgow & South Western Railway, Girvan-Challoch Junction, about 31 miles with 14 exchange posts; Dalrymple Junction-Dalmellington, Annbank-Cronberry, about 32 miles, with 24 exchange posts. This leaves about 392 miles of single track on which hand exchange is in operation.

* * * *

Balancing Railway Carriage Wheels

A number of the United States railways have found that the hard riding of passenger coaches can be remedied simply by turning the wheels, which are often badly out of balance, and that no further change in the springing arrangements is called for. In the case of the light high-speed trains, it was quite common practice to take a small finishing cut over practically the entire wheel, and grind the treads concentric with the journals, thus ensuring accurate balance of the wheels. In this connection, it is of interest that at the Mechanical Division Convention held a few months ago, a speaker pointed out that a 1-in. flat spot on a 3-ft. 0-in. passenger vehicle wheel, rotating at a rate equivalent to 100 m.p.h. vehicle speed, produces a dynamic effect on the rail approximately equalling that of a 2½-in. flat spot on a wheel of the same diameter revolving at a speed equivalent to 60 m.p.h., measured as the speed of the coach. This fact emphasises the vital necessity of giving special attention to rotundity, concentricity, and balance of the wheels used on passenger trains, especially those operating in the modern ultra high-speed services. It cannot be questioned that many harmful wheel and rail reactions under out-of-balance conditions exact their toll in damage to rolling stock and reduced serviceability, even though these reactions may be concealed to a certain extent by effective springing.

* * * *

Opposition Ostracised

Elections are being made easier. Good results in the direction of saving time and sparing the electorate the mental anguish of indecision have been achieved in some countries by seeing that no voter has more than one candidate to choose from. Even where popular sentiment demands that the voice of opposition must be allowed to speak, it does not follow that any principles are violated if it cannot make itself heard. Such was recently the experience of Dr. Maniu, leader of the National Peasant Party in Roumania, who arranged to address his followers during a half-hour halt of his train at Cluj station, Roumanian State Railways. He must have overlooked the fact that while it is the pleasure and privilege of staff to speak hard words on occasion about their employers, to hear these valuable personages disparaged by outside parties is usually distasteful. And so, every time Dr. Maniu spoke critically of the Government, its servants in the persons of the State Railways engine drivers at Cluj station performed stridently upon their whistles. Finally, the driver of Dr. Maniu's train stemmed his oratory still more effectively by pulling out of the station ten minutes before time. The doctor was last seen seeking admission to the rear coach as it disappeared down the platform.

Jubilee of the Signal Engineers

THE Institution of Railway Signal Engineers was incorporated in 1912, and has this month completed a quarter of a century of activity. It is true that an institution with almost the same name was founded two years earlier, but, for reasons with which we are not now concerned, it had to be brought to a close, and the present body formed from the membership of the earlier and short-lived one. The need for a technical body to bring together those engaged in railway signalling and communication work in Great Britain, distinct from official ones such as the old Association of Railway Companies' Signal Superintendents and Signal Engineers (founded in 1891), became increasingly felt in the early years of this century, possibly owing to the growing use of power and automatic signalling, which, it was plain to see, would eventually change altogether the methods of working on some sections of line, especially in suburban districts. The new institution, small though it necessarily was for a time, thus answered a real want and its future was assured. Its foundation members were Mr. J. Sayers, Telegraph Superintendent, Midland Railway; the late Mr. A. H. Johnson, Signal & Telegraph Engineer, London & South Western Railway; Mr. H. W. Firth, Electrical Engineer, Great Eastern Railway; Mr. Charles Dutton, Signal Superintendent, Brighton Railway; Mr. W. C. Acfield, Signal Superintendent, Midland Railway; the late Mr. R. J. S. Insell, Chief Assistant Signal Engineer, Great Western Railway, and the late Mr. A. T. Blackall, Signal Engineer of the same line, who became the first President; the first Council was composed of the above named engineers and others occupying leading administrative positions in the signal and telegraph departments of the railways.

Signalling was expressly defined in the Memorandum of Association as including "the whole of the apparatus (electrical, mechanical, or otherwise), methods, regulations, and principles whereby the movement of railway or other traffic is controlled," a broad definition fully justified by the course of events. Road traffic signalling thus comes within the scope of the institution and has indeed already been the subject of papers before it, while marine signalling could presumably be similarly regarded. The war period, during which the chair was held by Mr. Arthur Hurst, naturally restricted the work of the institution, but with the return of better times the membership grew and the chair passed annually in turn to a number of well-known engineers, both of the railway world and signalling industry. Of these Mr. W. J. Thorrowgood, Mr. R. J. S. Insell, and Mr. R. G. Berry, have passed from the visible scene. A glance over a volume of the *Proceedings* today and comparison with one of 20 years ago shows how the institution has increased in usefulness and prosperity. The long list of papers read, with discussions, covering a very wide range of subjects, and the presidential addresses, form a collection of material, the greater part of which must always be very useful for reference, while the work of members who have served on committees, such as the Three Position Signalling Committee, whose work has had a marked influence on practice in this country and elsewhere, or as representatives on committees of the British Standards Institution, forms a valuable contribution to the advancement of safety in railway operation.

On several occasions the institution has held summer meetings abroad, in France, Belgium, Holland, and, this year, Germany, inspecting installations at the invitation of the principal railway administrations, and numbers among its members and honorary members names prominent in signalling, both on the Continent and in

America. It has many members in the Colonies and Dominions, and a local section in South America. Under a bequest of the late Mr. Thorrowgood it is making an important contribution to the improvement of education for the railway service, while it is also building up a library that is steadily growing more comprehensive and useful. Railways today are facing very different problems from those confronting them when they were the sole means of rapid transit. To meet them satisfactorily requires the application of the latest scientific knowledge to signalling—in the wide sense above spoken of—as much as to the other branches of railway operation, making the interchange of knowledge, experience, and opinions among those concerned more and more necessary. The Institution of Railway Signal Engineers, which has already deserved well of the railways and the signalling profession during its first 25 years, has therefore even more valuable work still to do, and carries with it our best wishes for a successful future.

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Austrian Federal Railways in 1936

THE annual report of the Austrian Federal Railways for 1936 shows that the improvement which might have been expected from the increased industrial activity on the Continent has not yet materialised. Operating receipts amounted to 409.8 million schillings, of which 391.8 millions were traffic receipts proper, compared with 410.8 and 394.4 millions respectively in 1935, transport tax being subtracted in both cases. Until 1935 inclusive, the proceeds of this tax were left in the hands of the railways, but last year they had to be paid to the treasury, the amount being 17.3 millions. The operating deficit was 45.3 million schillings against 38.2 millions for 1935, and the total deficit on the undertaking, after meeting all interest, depreciation and other charges, was 86.6 millions against 87.2 millions for the previous year. Thus the improved economic and trade conditions in the country have not yet led to improved receipts, a small decline being experienced, as in the case of a few other Continental administrations. The improvement in goods receipts felt in 1934 and 1935 did not continue while passenger and parcels receipts dropped once more; the total was unfortunately the lowest experienced since the Federal Railways were constituted. The percentage drop in the year, 0.7 per cent., which had been improving of recent years, showed no material change. Total goods receipts were 261.3 million schillings, or 1.6 millions—0.6 per cent.—lower than in 1935. This was entirely attributable to inland traffic, for which fewer wagons were called for, export and transit traffic improving and helping to meet the difficulty; here the greater average length of haul played a beneficial part. Import traffic declined to some extent. These results accorded with the tendencies registered in trade movements, especially in the drop in home consumption of a number of articles. Results recorded in the present year, however, lead one to hope that the unsatisfactory position of 1936 will not be repeated.

It is only through a material increase in receipts that any appreciable improvement can be expected, there being now little possibility of further reducing working expenses. A reduction of 191.5 million schillings was effected between 1929 and 1934, but in the last 2 years some increase has been unavoidable, as essential modernisation and renewal work has had to be carried out. Costs of materials have so far risen very little, the supply of many being covered by agreements, and the increase in wages and salaries was negligible, while pension charges fell. There is some doubt, however, whether the peak burden of pension charges has been passed; changes in the age levels of some sections of the service may lead to another, though tem-

porary, rise in the near future. There were 51,071 persons employed, against 51,844 in 1935. The employees' own sickness and other social service funds are in a good condition. The improvement in the total deficit is due to repayments having reduced earlier interest charges, to reduced payments to subsidiary concerns and lower depreciation charges. Nevertheless the undertaking is still due to find some 11·9 million schillings to make up the normal contribution to renewals account, based on the estimated value of the property and its working life. The treasury has again assisted to a moderate extent with funds for certain productive improvements. Some 14 million schillings have been expended from the new works account, chiefly on civil engineering work. Funds provided by the State to cover the deficit and previous debts amounted to 99·8 million schillings, rather less than had been estimated for in the national budget.

Several changes in organisation have been made, chiefly in the purchasing department, with a view to more efficient use of money spent on materials. Coal costs increased, but improved methods led to a fall in sleeper impregnation charges. Much scrap was effectively disposed of. Suggestions for improved operation were invited from the staff and many useful ones received. The special electrical department at Innsbruck was closed, following the completion of electrification on certain routes. Many services, passenger and goods, were accelerated, chiefly on international connections, resulting in a day's saving on some east-west goods services. This also benefits the home traffic to some extent. Considerable improvements have been made to rolling stock and the methods of maintenance, resulting in much better user, and less stock is now required for the same traffic, while new goods rates and improved customs facilities at frontiers have met with much approval. Several stations have been rebuilt, and at Linz the level crossings that were such a hindrance formerly have been eliminated. Much relaying has been done and on the old Südbahn route the layout of several stations has been improved at the same time, including the terminus in Vienna. Many bridges have been strengthened, notably on the Semmering route. The Brenner station has been improved to correspond with alterations made on the other side of the frontier. Several new power signal boxes have been provided, some with frames having electric interlocking only, and track circuiting has been extended, also colour-light signals. Automatic telephone exchanges have been put in at a number of important centres, the service in Vienna being completely re-organised.

In the electric traction department a new power house has been planned for Stubach and also two more substations, while plans are complete for the overhead equipment and feeders for the Salzburg—Attnang-Puchheim section. Electric power consumed came to 152·4 million kW., against 142·8 millions in 1935, of which 76 per cent. was generated in the Federal Railways own power stations. The total power supplied by the five stations in the Innsbruck District was 145·4 million kW., against 134·2 in 1935, due to the Tauern line, additional traffic and higher transmission losses. The maximum one-day output was 556,000 kW. on December 24, 1936. The water reservoirs were fully refilled during the wet season. The activities of the railways' road transport subsidiary continue to be satisfactory and now cover 2,608 km. (1,620 miles) of route, while a scheme has been elaborated to eliminate wasteful competition and overlapping with the postal department services. The administration has continued to take a leading part in the activities of the Central European Railway Association and of other international railway bodies, in accordance with Austria's important position among European traffic routes.

Western Australian Government Railways

RESULTS of working the Western Australian Government Railways in the year ended June 30, 1937 were not so good as those of the previous year. Gross earnings improved by £15,876 or 0·46 per cent., but working expenses increased by £131,976 or 5·3 per cent. There was a saving of £6,967 in interest charges following the loan conversions which were in process of completion at the end of the previous year, but the final result was a deficit of £166,610, comparing with £57,477 for the previous year. The net revenue of £841,944 gave a return on capital of 3·25 per cent., against a rate of 3·946 per cent. charged for interest. There were decreases of 51,053 journeys and £8,087 in earnings from country passenger business due to depressed conditions resulting from a prolonged drought, but suburban travel showed increases of 339,109 journeys and £2,492 in earnings. On the goods traffic side the decrease in tonnage and ton-mileage can be principally attributed to the decline in wheat and wool production. The 1936-37 wheat harvest was the lowest for eleven years and the 1936 wool clip was the lowest for eight years. Increases were recorded, however, in B.C., 1st and 2nd classes, which cover the bulk of general goods. The decline in wheat and other low-freighted traffic and the greater tonnage in the higher-rated classes combined to increase the average ton-mile earnings from 1·72d. to 1·76d. Earnings from the B.C., and numeral classes represented 35 per cent. of the total earnings, as compared with 31 per cent. in the previous year.

The increase in working expenses was due principally to causes over which the administration has no control. The award of the Railways Classification Board accounted for an increase of £12,000, and basic wage increases represented approximately £44,500. Higher coal prices increased the cost of fuel by £17,700, and water haulage on account of the prolonged drought caused extra expenditure exceeding £16,000. Additional re-sleepering and renewals of rails and fastenings accounted for £10,500, and expenditure on rolling stock repairs increased by £4,500. Some railway operating figures are compared in the accompanying table:—

	1936-37	1935-36
Average miles	4,357	4,358
Train-miles	6,235,741	6,258,437
Ton-miles (paying goods and live-stock)	346,776,601	353,011,099
Passengers	12,709,583	12,421,527
Paying goods, tons	2,688,870	2,779,174
Operating ratio, per cent. ..	75·68	72·20
Passenger receipts	558,770	564,365
Goods and mineral receipts ..	2,409,478	2,398,873
Total earnings	3,462,037	3,446,161
Working expenses	2,620,093	2,488,117
Net revenue	841,944	958,044
Interest charges	1,008,554	1,015,521
Net loss	166,610	57,477

Among the general improvements noted in the report are the provision of shower baths in first-class two-berth compartment sleeping cars, and the conversion of six-berth compartments to four-berth in second class sleeping cars, which has been nearly completed. Of the six diesel railcars which were delivered towards the close of the financial year four are radiating from Perth to various country centres, and one each is stationed in the south-western and northern districts. These services should enable travelling times to be cut from 30 per cent. to 40 per cent., and thus be a boon to country travellers. Complete vacuum brake was fitted during the year under review to an additional 20 goods vehicles, and 56 of the new stock were similarly equipped. Two additional locomotives were equipped with turbo-generator electric head-

lights during the year. Between Morawa and Mullewa, a distance of approximately 59 miles, the 45 lb. rails have been replaced by 60 lb. AS "B" material. This permits a much more extensive use of heavy engines and obviates considerable banking of engines between Caron

and Mullewa. Deviations and regrading were completed during the year on the following sections: East Northam-Goomalling; Brunswick Junction-Collie; and Mullewa-Yalgoo. Substantially increased loadings have resulted from these works.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Main-Line Electrification

The British Railway Stockholders Union,
25, Victoria Street, S.W.1

December 8

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Your correspondent, Mr. Johnston, covers so much ground that it is not the easiest thing in the world to do justice to his letter within the brief time at my disposal. He opens with a comparison of costs per train-mile of steam and electric traction on the Southern Railway in 1936, which is, of course, a comparison of a dense suburban and semi-suburban traffic with traffic over hundreds of miles of thinly populated main line track, and of branch lines frequently operated at a loss.

It would be possible, of course, to refute this imposing table in many different ways; for instance, I might point out that Mr. Johnston, when he is dealing with steam, augments his wages bill by including the remuneration of drivers engaged in shunting, whereas the mileage covered by these drivers, which must reach a very considerable total in the course of a year, does not appear in his calculations. But it seems to me to be unnecessary to deal with this table in detail. I have never disputed that electricity is the cheapest motive power *when the costs can be spread over an intensive train service*. To compare the use of electricity where this condition is fulfilled with the use of steam where this condition does not obtain, serves no useful purpose. If Mr. Johnston, convinced by his own table, were to electrify the line from Reading to Westbury and Taunton, he would find that he could get his costs down to the figures in his table only by running trains at very frequent intervals. Would he do this? He might, of course. But there is not the remotest probability that the resulting traffic would meet the working expenses. In other words he is comparing something that you can usefully electrify with something which you cannot usefully electrify. In the manner in which he uses it, the table is, in fact, meaningless.

There follows a quotation from a work by the late Philip Burt who states that the town dweller is anxious to get into the country, and the countryman would like to come to town, and that electric traction can and should meet this situation. There is nothing unreasonable in this view, provided you have the town dwellers in sufficient numbers (as you have in London) and the country or the sea sufficiently close at hand (as you have in Brighton). I may point out, however, that the population of Brighton and London and the towns between them, greatly exceeds 8,000,000 persons. It does not follow that the same train service would be justified when the population is 200,000 and the sea 120 miles away. Mr. Johnston follows this up with the Weir Report. All I need say on that subject is that it is extremely improbable, to my mind, that the electrification of the railways would return 7 per cent. upon the cost of electrification plus the capital, represented by the companies at the present moment.

"To be sure," Mr. Johnston proceeds, "Mr. Ashley Brown has himself advocated the electrification of suburban lines round London. But why stop short at the London area?" I am sure I have not the faintest idea. I should have thought that electrification would have proved advantageous

wherever there existed traffic sufficiently intensive to make it remunerative. I have never held any other opinion and, as I have said, I really cannot answer Mr. Johnston's rhetorical question.

But the most baffling part of Mr. Johnston's letter is to be found in its tail. Here, if I read him aright, he is inclined to congratulate himself on the ground that in 1934 he outlined a scheme of electrification for the four railways. Since reading his letter I have looked it up, and it is very stimulating and interesting. However, the strong point in this proposal, according to the *Economist*, which Mr. Johnston quotes, is the fact that "it would involve the electrification of only 750 double track-miles out of a total for the four chief railways of 19,267 route-miles." My letter, published in your issue of November 26, was written in reply to Lord Weir, who, speaking in Glasgow, remarked that "the railways of this country must and will be electrified." He did not say, "we shall electrify 750 miles out of 19,267." It was because he failed to attach any limit to his proposals that I ventured to suggest that the electrification of the railways *en bloc* would prove a very unremunerative investment. Mr. Johnston must really make up his mind what it is he is advocating and what it is he thinks I stand for. No one will complain if he is wrong; a simple error is always preferable to utter confusion.

May I, in conclusion, endeavour to deal briefly with this matter as it appears when stripped of the complications so dear to certain minds? As I understand the situation, electricity is the most convenient, and in the long run, the cheapest motive power that we know of where the traffic is such as to require an intensive service of trains. Clearly, if we had two remunerative electrified areas within a comparatively short distance of each other, it would not be an unreasonable thing to electrify the railway between them, although this railway, regarded as an entity, might be incapable of producing the traffic to pay for itself. Generally speaking, however, our main-line traffic can be conveniently handled by heavy but fast expresses running at infrequent intervals. In all such cases the steam locomotive in its modern guise can deal with the position effectively and cheaply. Our branch lines, many of which, as things stand, are unremunerative, would seem to call for special treatment. The existing traffic frequently does not pay the cost of steam haulage; certainly it would not justify the very heavy initial expenditure involved in electrification. In such circumstances I am inclined to think that an intensive service of diesel cars might in some cases build up a remunerative local traffic. The alternative to this, and one which will bear investigation, would be the allocation of certain areas to road transport services, both for passengers and goods, working as an integral part of the railway system and radiating from certain more or less important centres on the railway main lines.

Finally, may I point out that it is not the function of this union to electrify railways or to prevent railways from being electrified. As I understand the matter, it is the duty and privilege of this union to preserve the balance of public opinion when, without sufficient reason, the scales appear to have been unduly depressed on one side or the other.

Yours very truly,

ASHLEY BROWN,
General Secretary

PUBLICATIONS RECEIVED

Mixed Traffic. By R. Barnard Way. London: Ivor Nicholson & Watson Limited, 7, Paternoster Row, E.C.4. 10 in. \times 7½ in. 160 pp. Illustrated. Price 6s. net.—As a kind of sequel to his previous book of the same size and format, entitled "Famous British Trains," the author has now compiled a similarly racy account of his experiences when riding on locomotives and in guards' brakes by express passenger, postal, fast freight, and slow goods trains, when watching the working of signal boxes and marshalling yards, and in a tour through a locomotive works. His object, as he remarks in a preface, has been to present a vivid picture of some of the details which go to make possible the safe and efficient operation of the trains that he has previously described; in large measure, he has succeeded in doing so, and thus has justified the appropriateness of his title "Mixed Traffic." In one respect, however, the contents are rather too mixed, for the last chapter consists of a comprehensive rebuke administered to British locomotive engineers in that they have neglected the wholesale adoption of compound propulsion; even if such a chapter were appropriate to a book of this description, which it is not, the vexed question of compound *versus* simple propulsion will hardly be settled by so naive a disquisition as this. Various minor errors in the book also require correction, as in the author's previous work; but apart from these blemishes, as a species of light reading about railways the book will pass many a pleasant half-hour. A little more extent and variety in the illustrations would have been an advantage—the Great Western Railway, for example, does not figure in any illustration, and is scarcely mentioned in the text—but in all other respects the production of the book is of an excellence that we are accustomed to associate with its publishers.

Locomotive Charts.—The Locomotive Publishing Co. Ltd. has recently issued another of its well-known locomotive charts, this one being a sectional elevation, plan, and cross-sectional drawing of one of the L.M.S.R. 4-6-0 mixed traffic engines of Mr. Stanier's design. The reproduction, in the colours ordinarily associated by draughtsmen with the different materials used, has been faithfully carried out, and the printing is clear in all respects. It is, we think, a pity that the locomotive was not depicted with the later (*i.e.*, domed) boiler, if only because the regulator valve is now located in the dome, and not in the header as shown on the chart, whilst the heating surfaces and grate area vary considerably and are shown smaller than they now are. Numerous engines of the class still have the boiler depicted on the chart,

but as no reference is made to the alternative boiler and its heating surfaces, there is likely to be some confusion among those who purchase the chart, and who also follow L.M.S.R. practice by other means, as to which set of dimensions is correct. We ourselves found this difficulty in producing our book of locomotive diagrams, "British Locomotive Types," receiving, in due course, a number of inquiries relative to differences between heating surfaces and other boiler parts shown in the drawings given serially in THE RAILWAY GAZETTE, and those which finally appeared in the book. As a matter of fact, all the boilers in a given class of engine do not tally in every respect, but where there has been an increase in the heating surface areas, and many of the engines have been built or altered to conform to those dimensions, there may be some disappointment if the older and smaller figures are adhered to.

There is another small criticism which we would make, and that concerns the method of showing the tyre flanges on all the wheels of the engine in the sectional elevation drawing. These have a rounded instead of a flat appearance, giving the impression of a wheel fitted with a pneumatic tyre. No one is, of course, likely to be deceived, but seeing the otherwise high standard of reproduction from the draughtsman's point of view, it would in our view have been better had the same care been taken in this direction also. For students, enginemen, and numerous others, the chart, on which all the principal parts are numbered and the corresponding names of the parts given below in tabulated form, is of great educational value, and worth every penny of the published price of 1s. 6d.

100 Years in Steel.—In 1837 Sir John Brown began business on his own account and thus inaugurated the business which has now grown into the very extensive undertaking known as Thos. Firth & John Brown Limited. It was not until five years later, namely 1842, that Thomas Firth with his two sons Mark and Thomas founded the firm of Thos. Firth & Sons, and the businesses grew up side by side until 1930 when Thos. Firth & Sons Ltd. was amalgamated with the steel producing interests of John Brown & Co. Ltd. to produce the present undertaking, which was formed under the chairmanship of the second Lord Aberconway. To commemorate the Firth-Brown Centenary the company has produced a handsome bound volume giving an account of the history and progress of the two firms from their earliest beginnings until the present year, and all connected with the production or use of steel should find it a fascinating book to peruse and one, moreover, which is well worthy of permanent preservation. It begins with a chronology of the two

businesses showing both their progress as commercial undertakings and also their contributions to the development of the steel industry. For example, under the date 1849 appears the entry "Sir John Brown invented and patented the conical spring buffer"; and one of the events which marked 1856 is "Sir John Brown invented the hydro-metric method of testing railway springs." There are human-interest sidelines to what might otherwise have been a heavy industrial volume, such as the record that 1856 also saw the establishment of the first crinoline mill to roll steel for crinoline skirts. The left-hand pages are devoted to this chronology and the right-hand pages to excellent full-page coloured plates of the pioneers and their early business cards. After the chronology appears a brief history of the businesses generously illustrated in colour and reading in running narrative. Throughout, the illustrations are happily chosen and admirably reproduced and the whole volume makes a worthy and lasting souvenir of a notable centenary.

Electrical Point Machines.—A new illustrated catalogue of electrical point machines has been published by the Siemens and General Electric Railway Signal Co. Ltd., East Lane, Wembley. The combined type machines are provided with a.c. or d.c. motors, the latter for 110-V. or 30-V. supply. It is a feature of the d.c. pattern that the same motor is used for either voltage, conversion being effected by a simple alteration to the field connections on the motor terminal block. These machines may be fitted for right- or left-hand operation, and if required both ends of a crossover can be operated from one machine. Hand-crankers are provided for emergency working. The separate type machines have similar electrical and mechanical characteristics; this type is specially suitable for hump yard working and can be supplied for high-speed operation capable of throwing the points in 0.5 sec. Several pages of diagrams show the application of the machines to points and crossings of various types, and typical circuit diagrams are included for both classes of machine.

Jewish Monuments in France.—An illustrated guide to Jewish monuments in France has been issued by the Centre National d'Expansion du Tourisme, du Thermalisme, et du Climatisme, and is obtainable in this country from the French Railways National Tourist Office, 179, Piccadilly, London, W.1. The booklet opens with a brief history of the Jews in France, and then proceeds to detail Jewish relics in various museums, libraries, and other institutions in Paris. Jewish memorials and institutions in the rest of France are briefly described and illustrated in the succeeding pages, which collectively present an outline history of the establishment of Jewish communities in the country and their contributions to scholarship, science, and commerce.

THE SCRAP HEAP

BUFFALO DERAILS MAIL TRAIN

According to a Reuters message from Singapore, the engine and six coaches were derailed when the Kuala Lumpur to Singapore mail train collided with a stray buffalo in North Johore recently. No passengers were hurt, but a Tamil, who is believed to have been a trespasser on the line, was killed.

An unclaimed suitcase was recently opened by the Railway Express Agency in San Francisco, and among other things it was found to contain a tightly-closed cigar box with something inside which rattled when shaken. When the cover was prised off, there lay a horned toad, apparently dead. An examiner touched one of the "horns" and the creature came to life. It had survived without food, water, or air, in "solitary confinement," at least since April, 1936, when the suitcase had been sent from Newton, Kansas, to Seattle, where it remained for over a year without being collected.

On Thursday, May 24 (1883), the great suspension bridge connecting Brooklyn with New York was formally opened by President Arthur. The main span which forms the bridge proper is 1,595 ft. in length, the land spans are 930 ft. each. The engineer, Roebling, did not live to see the completion of his great work, dying from lockjaw through injury to the foot; his son, who carried out the work, also met with a sad mishap, contracting a peculiar complaint through working in the caissons which prevented his regular attendance at the scene of

operations. The bridge has been 13 years building.—From *"Herapath's Railway Journal"* for May 26, 1883.

DICKENS AND THE EST

A little-known tribute by Charles Dickens to the comfort of the Est is contained in the following extract from a letter dated "Hotel de Paris, Strasbourg, October 13, 1853." This letter was written by Dickens to his wife while he was on a holiday abroad with Wilkie Collins and Augustus Egg. It is quoted from page 177 of the volume "Mr. and Mrs. Charles Dickens: his letters to her" published by Constable & Co., London, in 1935. "We got here at 7 last night. We left Paris at a quarter past 8 in the morning and travelled all day (the distance is nearly 300 miles) by the very best Railroad I have ever seen. We dine today at half past 2, and go on at half past 4 by the Railroad to Basle. We are due there before 10 and go on tomorrow morning early."

SOUTH AFRICAN RAILWAY MISSION

The *Rhodesia Railways Bulletin* for October describes the work of the South African Railway Mission. The mission was inaugurated early in 1890 under the direction of the Rev. Douglas Ellison, although prior to that time certain work amongst railway employees in remote places had been carried out by a priest known as Father Simeon. With the subsequent growth of the railways in South Africa and later on in Rhodesia, the scope of the work increased, and there are

today eight priests and seven women workers, who travel regularly over some 14,000 miles of railway bringing to people in lonely places the services and ministrations of the Church. An impression appears to be prevalent that the work of the Railway Mission is principally among natives, but this is by no means the case. The head office of the mission is at Johannesburg and there is also a London office at 40, Wood St., Westminster. The *Bulletin* adds that the Railway Mission has the support and assistance of the railway administration, "for it fulfils a real need in its ministry to those of our employees and their families isolated from the contacts available in the bigger centres of our undertaking."

A ten-year patent has just been granted by the Emperor of Russia to one of his aides-de-camp for the invention of a new species of road, which it is calculated will excel all others. The plan is to place the wheels (mere friction rollers), not upon the carriages, but upon the rails of the road itself, and to have it travelled over by sledges, drawn by horses. The experiment has been tried in the neighbourhood of St. Petersburg, and it is said that a horse can gallop at the top of his speed, and draw a great load after him.—From a *Frankfort paper* of April, 1837.

SAFETY FIRST DISCIPLE

Old lady (to porter): "Has the 3.20 gone?" Porter: "Some time ago, madam." Old lady: "And the 4.55?" Porter: "Over an hour to wait." Old lady: "And is there no other in between?" Porter: "No, madam." Old lady: "There, come on, John, we can get across the line now quite safely."

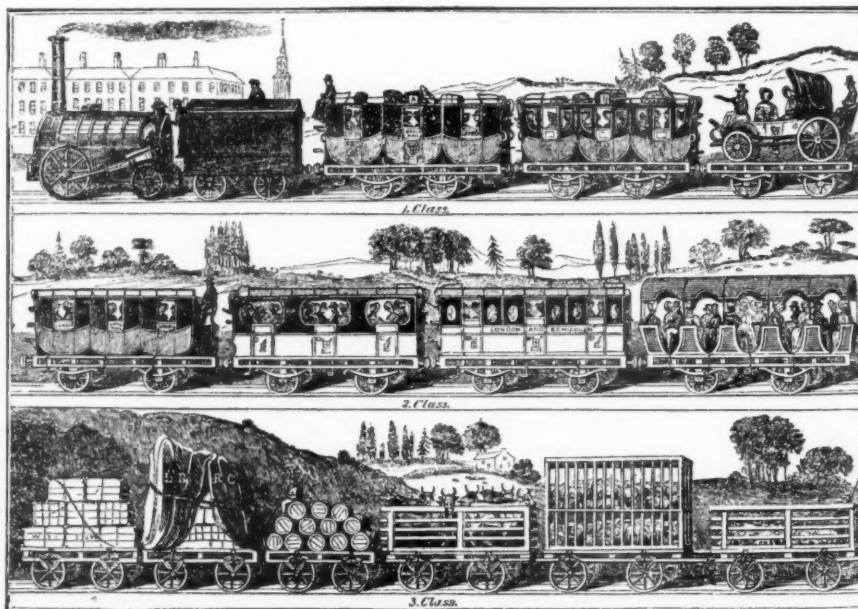
Trains of 1837

The accompanying plate is reproduced from the issue of *"The Mirror of Literature, Amusement, and Instruction"* for July 22, 1837. The text explains that "the three trains of railway carriages are from sketches made by our artist. Each train has its respective engine; though, in order to enable the draftsmen to show all the varieties of carriages, the engine has not been repeated in the second and third trains.

"In the first class trains, are the engine and its supply carriage. Next are first class carriages for passengers, and a gentleman's private barouche.

"In the second class train, foremost is the Royal Mail, next are excursion carriages, and carriages for passengers, generally.

"Thirdly, is a train of carriages for cattle, wagons, &c."



OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

BRAZIL

Leopoldina Railway and Import Duty Exemption

The *Diario Official* has now published the report, submitted by the Minister of Transport to the President of the Republic, regarding the petition made by this railway on February 5, requesting an extension of the period established in Clause VIII of the contract dated June 26, 1907, whereby exemption was granted from the payment of import duties on material necessary for the working and maintenance of the railway. This exemption was granted for a period of 30 years, as compensation for the obligations assumed by the railway in undertaking to link up the States of Rio de Janeiro, Minas Geraes, and Espirito Santo, as stipulated in various contractual clauses, approved by Decree No. 6456 of April 20, 1907. These obligations had been fulfilled, and it was stated that the petition now made represented an extension of the period for payment, rather than exemption, inasmuch as—in accordance with Clause XI of the contract—the company was obliged to hand over to the Treasury certain amounts every year, relative to what should be paid in import duties, but calculated on gross revenue, in the proportion of 4 per cent. when it should reach 8 to 10 contos a km.; 6 per cent. when between 10 and 12 contos; and 10 per cent. when gross revenue should reach or exceed 15 contos a km.; up to December 31, 1936, the sum of 3,066 contos had been handed over. (*Diario Official* of June 6, 1937.)

It was pointed out by the Leopoldina Railway that, when the contract was signed, nearly all local railways enjoyed exemption, without any corresponding obligations, and even in its own case, in later contracts, such had been agreed upon. When the first contract was signed, it was realised that the concession made did not correspond to the amount of capital involved, although, at the time, it was hoped that traffic would develop, and receipts increase, as, in fact, had happened. It was not foreseen, however, that depreciation in exchange, and heavy increases in expenditure, out of all proportion to the development observed in the territory served—and beyond the railway's control—would nullify the benefit accruing from increased takings.

The Petition Accepted

The Minister of Transport, after duly considering the costly equipment of railways, and especially the permanent way and its renewals, telegraph, telephone, and signalling apparatus—equipment not required by other forms of transport—and after paying due regard to the fact that fixed freights and timetables had to be worked to by the rail-

ways, concluded that the petition was justified.

It was further recalled that in June, 1907, there were no restrictions on exchange, and conversions could be made, normally, at 16 milreis to the pound. Depreciation of local currency—to approximately 80 milreis to the pound at time of writing—provided sufficient reason for Government intervention in this exceptional case, and everything indicated that the railway's position in regard to exemption from the payment of import duties, should remain as before, until such times as its various contracts could be revised to meet present requirements and tendencies. It was suggested, as an emergency measure, that the Executive Body should decree a prorogation of Clause VIII of the contract dated June 26, 1907, and consider gross revenue on the basis of the stabilisation rate fixed by Decree No. 1575 of December 6, 1906.

INDIA

State Railway Earnings: Another Turn in the Tide?

For the first time in the present financial year, the earnings of the Indian State-owned railways fell below the figures for the corresponding period of 1936-37 during the second week in October. The recovery in the following period raised the hope that the set-back was only temporary, due, perhaps to the early incidence of the Puja vacations last year and to the exceptional out-of-season traffic in wheat in October, 1936. But the total approximate gross earnings for the first ten days of November, amounting to Rs. 236 lakhs, again fell below the approximate figures for the same period last year by Rs. 8 lakhs—the deficit is increased to Rs. 13 lakhs if the actual audited figures for the first ten days of November, 1936, are taken into consideration. In spite of a deficit of Rs. 2 lakhs in the second week of October, that month concluded with a net increase of Rs. 22 lakhs, and it is hoped that the decline in the first week of November will be made up during the month. Although the total approximate gross earnings from April 1 to November 10, 1937, show an increase of Rs. 365 lakhs over the actuals for the same period last year, it seems improbable that the increase in earnings for the remaining months of the financial year will be maintained in the same proportion, as the improvement in traffic had actually commenced about the end of 1936.

N.W.R. Traffic Further Improve to September

The good financial record of the North Western Railway for the year 1936-37—[recorded in our issue of August 27—Ed., R.G.]—has been well maintained during the first six months

of the current year, namely, April 1 to September 30, 1937. For this period the gross earnings amounted to Rs. 823 lakhs as compared with Rs. 749 lakhs for the first half of the previous year, an increase of Rs. 74 lakhs (£555,000). Coaching earnings accounted for Rs. 16 lakhs of the improvement, due to an increase of two millions in the number of passengers carried, a gain of 5.8 per cent. This alone is no small achievement in these days of ever-increasing road competition. Goods earnings, apart from the small increase under "Miscellaneous," accounted for the rest of the improvement and showed an increase of nearly Rs. 56 lakhs, which was chiefly attributable to large exports of wheat but partly also to the greater movements of oil-seeds, kerosene oil, and general merchandise.

Railway Breaches in South India

Heavy rainfall occurs in South India at this time of the year, usually with consequent damage to railway lines. Several breaches are reported to have occurred on the Madras & Southern Mahratta and South Indian Railways, causing much dislocation in railway and road services; large areas have been submerged. Repairs to railway breaches have been taken in hand with promptitude, and normal railway communications are being gradually restored.

VICTORIA

Melbourne-Albury Limited

Complementary to the notes on page 439 in the September 10 issue of THE RAILWAY GAZETTE, are the following few additional facts about the Melbourne-Albury Limited. The permissible load up and down with either one "S" class or two "A2" class engines is 500 tons, and the maximum speed allowed at any point is 70 m.p.h. At Heathcote junction 33½ miles from Melbourne, the line attains an altitude of 1,145 ft. above sea level. The legend "The Spirit of Progress" is displayed on the rear of the trailing or observation car. The current timings in force are as follow:—

a.m.	Miles	a.m.
6.30 (dep.)... 0	Melbourne... 11.30 (arr.)	
8.0 (pass)... 61½	Seymour ... 10.10 (pass)	
9.0 (pass)... 121½	Benalla ... 9.12 (pass)	
10.20 (arr.)... 190½	Albury ... 7.55 (dep.)	

EGYPT

New Diesel Cars for the Helwan Line

It has been decided to purchase two single-unit Ganz diesel railcars for parcel and postal traffic on the Helwan Line at a cost of £E.13,000. This decision is in conformity with the policy of replacing all steam trains and rolling stock on this line by diesel units.

Antiquary Excursion to Luxor

A special Antiquary train, the coaches of which are provided with seats convertible to sleeping berths, will leave Cairo at 8.30 p.m. on

December 4 for Luxor; it will return at 7.55 p.m. on December 6.

A special coach will be reserved for ladies with a maid in attendance. The inclusive fare is £E.2, which covers the cost of the return ticket, food for two days (3 meals a day), hire of a blanket and pillow and sleeping accommodation during the journey and stay at Luxor, local transport at Luxor and entrance fees to the Monuments. As the distance from Cairo to Luxor is 670 km., this is a remarkably moderate excursion.

UNITED STATES

New Pennsylvania Coaching Stock

The Pullman Company is now building over 100 sleeping, lounge, and observation cars for the Pennsylvania Railroad New York-Chicago expresses. Those intended for the Broadway and Twentieth Century Limited trains will contain improved private room accommodation of the drawing room, compartment, and roomette types [described and illustrated, as used west of Chicago, in our issue of August 27 last—Ed., R.G.] affording maximum privacy and comfort at moderate expense.

In the drawing rooms the beds which fold into the wall, are arranged longitudinally to the coach, and leave additional space available in daytime. A sofa-bed replaces the former seats by the windows, and the third or upper bed is put away when not in use. Space is also a feature of the new compartments, with their upper and lower beds. The upper one above the windows folds up and the lower forms a couch by day; an easy chair is also provided. The roomette is a single-berth compartment, with folding bed, forming an attractive day sitting room. All beds are 6 ft. 5 in. long and each form of room has complete toilet facilities.

The new cars are all of high-tensile alloy steel fabricated by welding and with unbroken, smooth exteriors. The steps to the doorways fold up when the train is running, and skirts below the car bodies assist the streamlining effect and hide the air-conditioning, lighting, and brake gear. Starting and stopping shocks will be reduced by a new type of tight-lock coupler and rubber draft gear. All cars will be completely air-conditioned, and occupants of drawing rooms, compartments, and roomettes can regulate ventilation and temperature to suit individual requirements.

SPAIN

Collectivisation in Catalonia

The Generality of Catalonia published an Order in August last calling on all collectivised entities to legalise their position under the Decree before September 15, and this period was subsequently extended to October 15. Now it is announced that the Valencia Ministry of Defence will buy no material except from firms whose legal position is in order, that is to say from firms that

are functioning under their former owners, or those controlled by the Ministry of Economy. On October 5 the Generality published another Decree, ordering the technical and administrative control of all undertakings producing or distributing electricity in Catalonia by a commission composed of three officials from the Department of Economy and one from the Department of Finance, assisted by three representatives of each of the syndicates, C.N.T. and U.G.T. The object of this Decree would appear to be to afford the Government a closer control over undertakings which have heretofore been run by workmen. A later development is the Decree of November 10 last, creating the Caixa de Credit Industrial y Comercial with a head office in Barcelona. The intention of this Decree is (i) to concentrate the profits made by undertakings collectivised by the Decree of October 24, 1936, and invest them in accordance with the proposals of the Catalan Council of Economy and the General Industrial Councils, and (ii) to provide credit and banking facilities for the said undertakings. The capital will be provided (a) by an initial payment by the Generality of 25 millions of pesetas, (b) by a levy on all the collectivised undertakings of 50 per cent. of net profits, and (c) by any other payment the Generality may decree. The full text of this Decree is contained in the *Diari Oficial* of November 14.

PORTUGAL

Road and Rail Co-ordination

The Minister of Public Works has appointed a commission, under the presidency of Senhor Antonio dos Santos Viegas, to study the question of the co-ordination of road and rail transport. Meanwhile, says the *Gazeta dos Caminhos de Ferro*, the question of road competition, which is of vital concern to the railways, is every day becoming more acute with the increase in the number of lorries fitted with heavy oil engines, the import dues on heavy oil being absurdly low in comparison with those on petrol.

SOUTH AFRICA

Traffic Increases

Speaking at a gathering of the South African Institute of Electrical Engineers recently, the Minister of Railways, Mr. O. Pirow, looked forward to an extensive railway expansion programme by the creation of new routes through the linking up of existing

branch lines to relieve main lines in time of pressure. The Government has authorised the administration to inquire into the possibilities of these alternative routes.

In a comprehensive review of South African railway progress, the Minister said that they had been subjected to pressure to an extent that no other railway in the world had experienced, at any rate since the Great War. Comparing the period April to August, 1932, with the corresponding period of 1937, tonnage of traffic carried had increased nearly 70 per cent., ton miles 102 per cent., passengers more than 50 per cent., and truck loadings more than 50 per cent. Comparing 1937 with 1936 the increases had all been of a sudden nature. Petrol had increased 183 per cent., manganese 139 per cent., chrome 63 per cent., maize no less than 972 per cent., and citrus 112 per cent. There had also been a phenomenal increase in harbour traffic.

During the first five months of 1932 road motor services conveyed under 1,000,000 passengers compared with 2,300,000 in 1937, and lorry traffic had increased 178 per cent.

To cope with abnormal traffic various steps had to be taken, such as the diversion of 301,038,000 ton-miles in respect of citrus, maize, and locomotive coal.

Rolling stock had been ordered on a very large scale, but had been held up by rearmament in Great Britain. At the end of the depression in 1932-33 there had been a surplus of trucks over requirements. This year, when everything was authorised, there would be a 50 per cent. increase over 1933. Since March, 1933, £9,000,420 had been expended on vehicles placed in service. In addition, there was a special amount allocated for engines and vehicles not yet delivered, totalling £12,595,720. Nearly £600,000 had been spent on road motor vehicles, and there were on order vehicles costing approximately £1,000,000.

Railway Earnings

The earnings for the first four months of the financial year, that is from April 1 to July 31 (railway transportation services only) amounted to £10,957,789, an increase of £682,857 over the corresponding period of the previous year. Railway working expenditure was £7,182,599, or £524,388 more than in 1936.

Staff

The number of staff in the service of the administration of the South African Railways and Harbours, at the end of August, 1937, totalled 115,120, made up as follows:—

	Salaried Staff	Other Graded Staff	European Labourers	Non-European Labourers	Total
In permanent or temporary employment	10,748	33,019	14,171	22,857	80,795
Employed on a casual basis	—	2,571	3,458	28,271	34,300
Employed on new construction and new works under piecework conditions	—	—	25	—	25
Totals	10,748	35,590	17,654	51,128	115,120

REBUILDING THE MOFFAT RAILROAD, U.S.A.

This well-known route through the Rocky Mountains, until recently decrepit, bankrupt, and derelict, has now been converted into a first class high-speed line

A REMARKABLE work of resuscitation, rehabilitation, and realignment has now been all but completed, transforming the dismal failure known as the Moffat Railroad, with its tortuous alignment abounding in $5\frac{1}{2}$ -ch. curves and long lengths of 1 in 25 gradients, into part of a transcontinental route for express and heavy freight working. We are indebted to our American contemporary *Engineering News Record* for the following details and diagrams of this noteworthy achievement.

In 1902 David H. Moffat inaugurated the Denver & Northwestern Pacific Railway, with the idea of constructing a new direct route from Denver to Salt Lake, an object never attained by him. Construction began in 1903, and the first 46 miles, involving 29 tunnels and many $5\frac{1}{2}$ -ch. curves, from Utah junction outside Denver through South Boulder Canyon and Boulder Park, were completed. In continuation of this section of line Moffat had intended to tunnel the Continental Divide near the subsequently-built Moffat tunnel, but he could not secure the necessary funds, and had to be content with a comparatively cheap alternative in the shape of a sinuous, 23-mile, 1 in 25 alignment, rising to an altitude of 11,600 ft. to cross Rollins Pass. Not only was this an impossible section to maintain, but, cheaper though it was, it exhausted his finances, and work stopped at Arrow, 75 miles from Denver, and on the western descent, in 1904.

After a three-year pause, work was resumed and a further 144 miles to Steamboat Springs were completed by 1909, when lack of funds again compelled a halt; whilst trying to obtain financial assistance, Moffat died in 1911. The concern went into the hands of a receiver in the following year, but in 1913 was reorganised by the Denver & Salt Lake Railroad Company, and in 1914 the

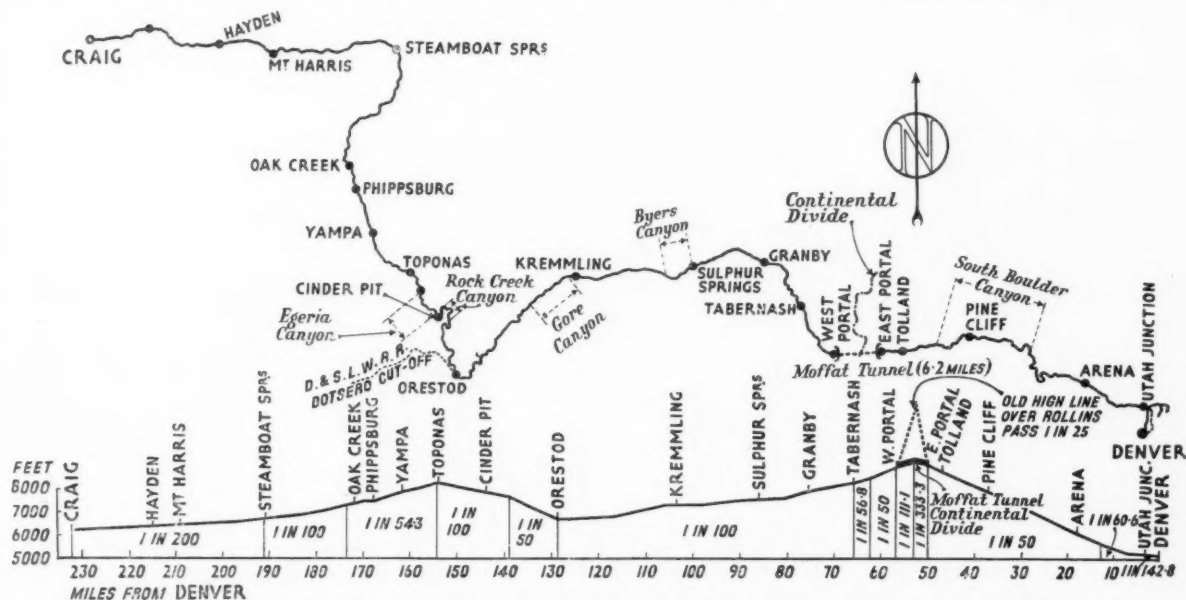
line was completed to Craig, the present western terminus, 255 miles from Denver. Within three years, however, the high cost of working—particularly the difficult 1 in 25 section varying in altitude from 9,100 to 11,600 ft.—once more caused the company to go into liquidation, a state in which it remained until 1927, when the Denver & Salt Lake Railway was formed.

Completion of Moffat Tunnel and Important Agreement

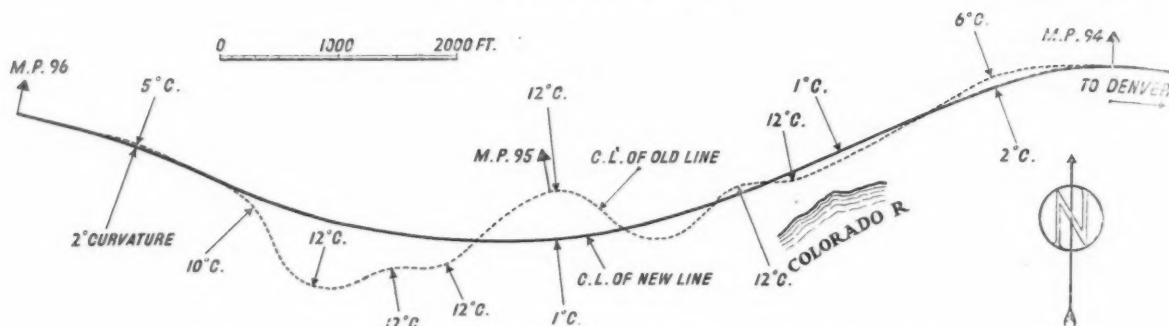
Meanwhile, in 1923 the Moffat Tunnel District, the territory served by the line, financed the construction of the great Moffat Tunnel, 32,798 ft. in length and completed in 1928 at a cost of \$18,000,000 (three times the estimated figure). Financial arrangements were made between the district and the railway company, which abandoned the high-level line as soon as the tunnel was opened; actually, the last of the old permanent way was only recently removed from it.

In 1928 an important agreement was reached with the Denver Rio Grande Western Railway, whereby the latter obtained running powers over the 125-mile section from Utah junction to Orestod, to enable through services to be run between Denver and Salt Lake as soon as the D.R.G.W. Dotsero cut-off was completed from Orestod. It was this agreement that made possible the great rehabilitation scheme now nearing completion.

The necessity for this will be the better appreciated when it is realised that constant financial stringency had compelled the cheapest possible standard of construction, equipment, and maintenance; the last-named at times became almost non-existent. For instance, in 1926, there was no ballast at all anywhere throughout the line, the



Plan and gradient profile of the Moffat Railroad showing the various canyons traversed, also the Dotsero cut-off forming the continuation of the transcontinental route and the old high level line over Rollins Pass, both dotted



A typical section of line as realigned with 1- and 2-deg. instead of 10- and 12-deg. curves

sleepers were all untreated, numerous timber viaducts were rickety with neglect, and many of the 55 tunnels were timber lined and also in want of attention. This state of affairs, coupled with the very steep grades and sharp curves without transition approaches, necessitated a restriction of even passenger train schedules to 15 m.p.h.

The Rehabilitation Works Involved

All this is now changed; 100-lb. rails have replaced the old and worn 80-lb. section, creosoted sleepers predominate, and two-thirds, or nearly 300, of the timber bridges have given place to stream diversions or embankments and culverts, usually corrugated iron pipes of from 2 ft. 6 in. to 6 ft. diameter. In addition, advantage has been taken of a deposit of hard but porous volcanic cinder that occurs on the line, to ballast the whole length with this material.

Long sections of realignment and almost innumerable easings of individual curves have eliminated all but two

5½-ch., one 6-ch., and one 6½-ch. curve; 7½-ch. is the new limiting radius. Moreover, all curves now have transition approaches and are canted for 60-m.p.h. speeds—except for local restrictions at certain curves—throughout 140 miles of the route. Even on other sections where the topography precludes realignment, the track has been so improved as to permit of 35- to 45-m.p.h. speeds apart from one length where 27 m.p.h. is specified.

Loops and sidings have been extended, and 100-car trains can now pass one another at points averaging five miles apart. Locomotive and other equipment has been modernised and the whole line brought up to a standard in keeping with its importance as a first class railway, part of which forms a section of a trans-continental route by virtue of the Dotsero cut-off, reducing the distance between Denver and Salt Lake by 174 miles. On the other hand maintenance costs have been reduced by 50 per cent., and the whole concern is now a flourishing and important undertaking.

THE RAILWAYS OF CUBA.—According to the Report on Economic and Commercial Conditions in Cuba, published by the Department of Overseas Trade, and dated August, 1937, Cuban prosperity, and therefore the prosperity of her railways, depends almost entirely on her staple product, sugar, which together with molasses and syrups constituted 82 per cent. of the value of the total exports in 1936. Under the head of transportation, the report says that any benefit the two main railway systems have derived from the improved conditions has been negated by road competition and by heavier operating costs consequent on social legislation. The law of April, 1936, for controlling road transport has never been enforced and the National Commission created for the co-ordination of transport services has made no progress. With 1,500 km. of highways paralleling the main railways, the companies have been forced to reduce tariffs to an uneconomical point and costly social legislation has come at a time when the railways are least in a position to bear it. There are said to be 15,000 passenger vehicles on the roads in Cuba, and 4,000 lorries. The bus and lorry companies ignore the legal tariff and other regulations, and operate on an absurdly low basis determined by the harsh competition among themselves. Certain companies, for example, offer a return ticket from Havana to Santiago de Cuba, 600 miles each way, for six dollars. The company which controls the greater part of the traffic in Havana and the outlying districts now has a gross income of over half a million dollars monthly, about as much as the present gross receipts of the United Railways. The gross receipts of the United Railways from July 1, 1936, to June 26, 1937, were \$6,759,137, as compared with \$5,591,174 for the same period of the preceding year. The total gross receipts of all public rail-

ways operating in Cuba during 1936 were \$19,456,766, as compared with \$15½ millions for the calendar year 1934. The results of the working of the United Railways of the Havana were reported in *THE RAILWAY GAZETTE* of November 26, 1937.

TREFOREST TRADING ESTATE.—The Treforest Trading Estate scheme, one of the Government-assisted measures to encourage new industrial enterprise in South Wales, does not operate for profit, and is thus able to lease factory buildings at especially low rates. Factories can be built to individual requirements and the cost of building is borne by the estate. At the moment certain standard factories are being built, some of which are already complete and in production. The G.W.R. main line from Cardiff to Pontypridd and Merthyr runs alongside the boundary of the estate, which is connected with the railway by sidings and every facility is afforded for the handling of all kinds of merchandise, both raw materials and finished goods. An illustrated folder, complete with key map and plan has now been issued by the proprietors of the enterprise, South Wales and Monmouthshire Trading Estates Limited, of Western Mail Chambers, Cardiff, giving full details of the amenities of the estate. Manufacturers considering the setting up of industrial undertakings are entitled to apply to the Commissioner for the Special Areas for the financial inducements provided in the Special Areas Amendment Act (1937) and the Finance Act. Loans for working capital or for the purchase of plant may be negotiated through the Special Areas Reconstruction Association, or through the fund recently established by the Treasury. The capital cost of the installation of the necessary services—electricity, gas, water, steam, sanitation—will be borne by the estate.

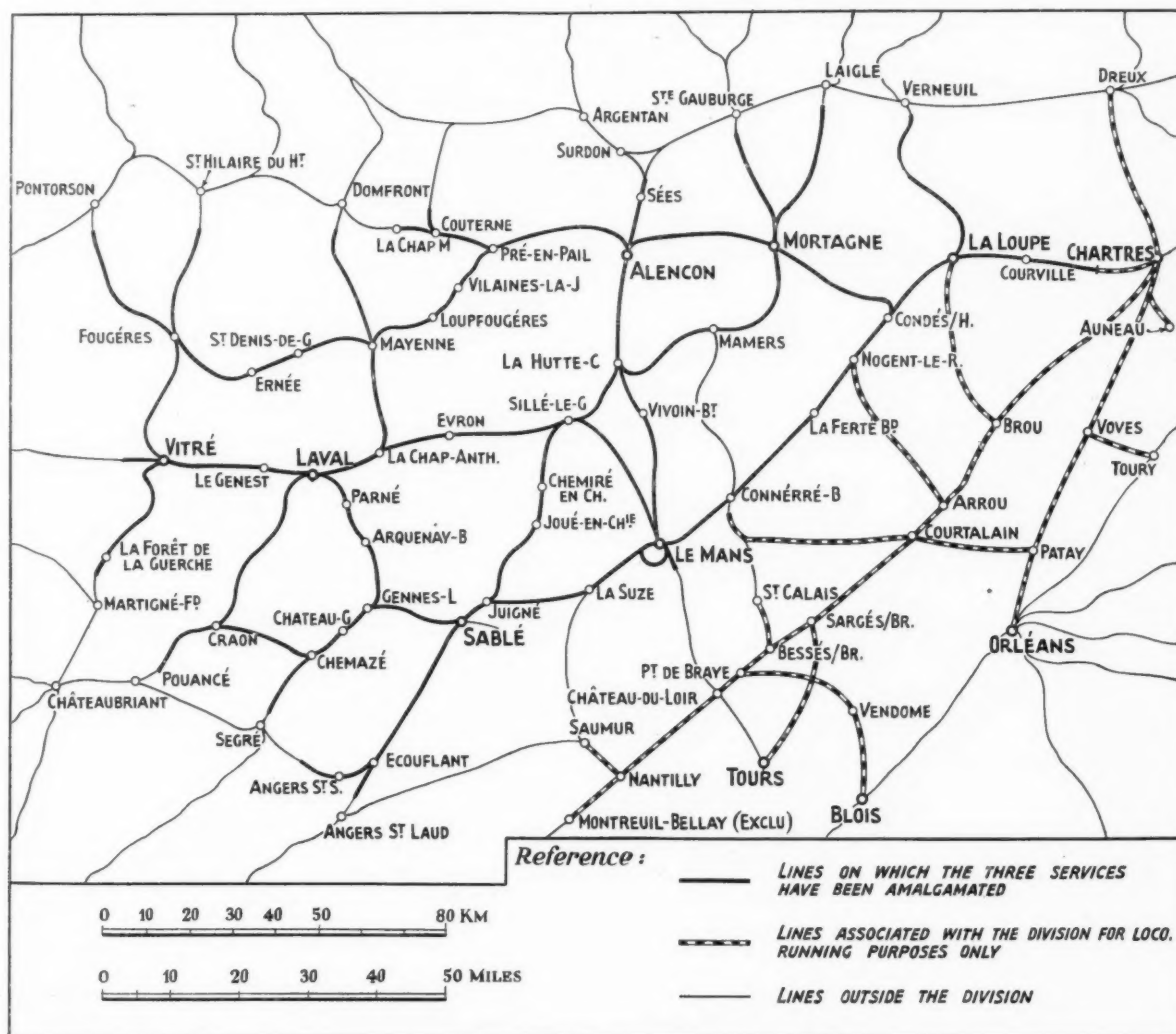
DIVISIONAL ADMINISTRATION ON FRENCH STATE RAILWAYS

An example of the delegation of authority and elimination of overlapping that assumes greater importance with the growth of centralised control from January 1 under the French National Railways administration

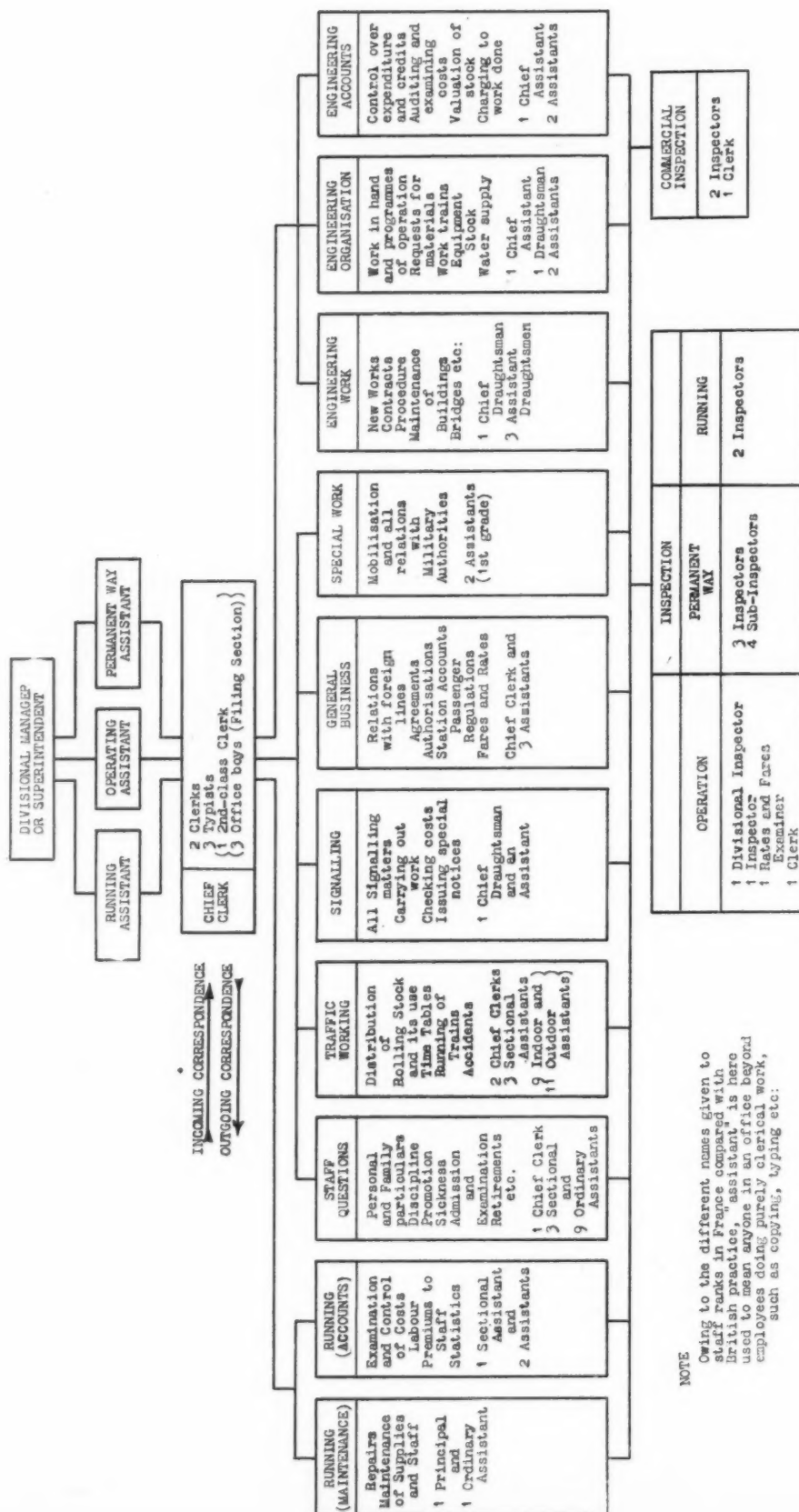
FOR some years past on the Nord and Etat lines in France, and more recently on those of the Alsace-Lorraine system, special *Commissions d'Organisation du Travail* have been studying questions of organisation with a view to saving expense and enhancing efficiency, both from the railway and public points of view. As a result of the recommendations of the Etat commission, the principle of combined organisation of the three services—operating, running and engineering—has been applied at Le Mans, and we reproduce from an article in the *Revue Générale des Chemins de fer* by M. Fleurst, a member of the commission, the accompanying map and diagram illustrating what has been done. The idea is really a revival of the principle applied in the days of the old Ouest Company, taken over by the Etat on January 1, 1909, but adopted by it only for lines of little

importance, whereas the new organisation is concerned with lines of all kinds. The line from Paris (Invalides) to Versailles is also now managed on a similar plan, and five small secondary lines radiating from Mortagne (see map), but the officer responsible for the latter is subordinate to the New Divisional Superintendent at Le Mans. Owing to the different staff classification in France, some of the expressions on the diagram are approximate translations, but suffice to show the general principles. The area covered includes 200 stations and halts, eight locomotive depots, seven permanent way districts, and 6,100 employees of all grades.

The principal object has been, M. Fleurst states, to eliminate watertight compartments and unnecessary correspondence between offices and staff, and to economise in use of stores and office space. In all these respects



The lines comprised in the divisional administration of Le Mans



Organisation chart of the Le Mans divisional administration, French State Railways

satisfactory results have been achieved. As far as possible the new arrangements allow of most business being discussed and settled in one main office, with few, if any reports being required from outside, while time and money are saved in eliminating unnecessary journeys to, say, the site where signal or track alterations are being asked for. In the new organisation one office alone deals with all questions affecting safe working and signal modifications. The employees in all parts of an office are expected to familiarise themselves with every side of its work, and to avoid excessive specialisation. Special steps have been taken to avoid unnecessary copying work.

All accident and breakdown questions are now dealt with under one officer, who is responsible for obtaining the information necessary to form a judgment on the various cases. A signalling inspector, in collaboration with this officer, deals with both the operating and technical sides of signalling. Throughout, the guiding principle has been to eliminate inter-departmental disputes, and the tendency or desire of one department to gain credit or advantage at the expense of others.

FOREIGN VISITORS.—The Travel & Industrial Development Association states that the total number of holiday visitors (276,578) to the British Isles during the first 10 months of this year already exceeds by 9,273 the total number of holiday visitors throughout the whole of the record year 1936.

RAILWAYS AND ROAD TRANSPORT SECTION

This section appears at four-weekly intervals

Co-ordinating Goods Services in New Zealand

A FURTHER step in the direction of single ownership of road and rail goods services in New Zealand has been taken by the Government in inviting a number of owners to negotiate for the sale of their road service businesses, and in setting up a complete purchasing organisation for the purpose. In this connection a recent statement by the Minister of Transport (the Hon. R. Semple) in regard to the need for co-ordination of various transport services to eliminate waste and reduce the cost of transport is significant. He said the Government was convinced that, so long as road freight services were run as small units wholly independent of railway freight services, little or no progress in real and effective co-ordination was possible. He also contended that a policy of single ownership of freight road and rail services over long-distance routes was based on sound economic grounds, and made it clear that the Government regarded all transport services as a national "key" industry in the Dominion. Mr. Semple further stated that the purpose of the new policy was to make long-distance road and rail services radiating from the four main centres of the Dominion complementary rather than competitive, and to weld them into an efficient service. The main result would be a reduction in lorry mileage, and wear and tear on roads, without any diminution in the standard of service offered; business men might rest assured that the new policy would mean a reduction in the Dominion's national overhead and transport costs. Following recent submissions by the Railway Department to the No. 1 Transport Licensing Authority, the authority decided not to renew the licences referred to for longer than 12 months. While the Railways Department is dealing directly with passenger services, a more involved procedure is being followed in the case of nine goods services which are affected in the Auckland District. Spares and equipment are examined by officers from the Transport Department, following which the books are investigated by the Treasury Department, tasks which occupy several weeks in the case of large businesses. An offer to operators is then made by purchasing officers. If not accepted the firm concerned has the opportunity to state a case before a special commission of inquiry appointed by the Government.

National Trailways Progress

ONE of the most interesting developments in long-distance passenger road transport in the United States within recent years has been the progress of the National Trailways system. This organisation, which was formed less than two years ago, consists mainly of railway-subsidary coach-operating companies. As we mentioned in our issue of June 5, 1936, the object of National Trailways is to provide a nation-wide organisation to co-ordinate road travel on through routes and to arrange for the vehicles engaged in the co-ordinated services to be finished in a distinctive livery. The constituent companies, however, retain their own identity and management. In the issue

mentioned, we reproduced a map showing the extent of the routes then concerned, which were maintained by eight distinct operating organisations. Since that time the system has grown rapidly, and with the companies recently brought within the scope of National Trailways, it now comprises coach operations totalling 32,201 route miles as follow:—

Company	Route miles
Santa Fe Trail System	10,840
Burlington Transportation Company	6,200
Missouri Pacific Transportation Company	4,925
Safeway Lines	2,044
Frank Marx Coach Company	1,906
Rio Grande Motorways	1,386
Missouri, Kansas & Oklahoma Lines	922
Dixie-Sunshine Bus Lines	658
Panhandle Trailways	624
Denver-Salt Lake-Pacific Stages	542
Lincoln Trails System	510
Central Ontario Bus Lines	476
Peoria-Rockford Bus Company	417
Windsor-Chatham-London Coach Lines	274
Denver-Colorado Springs-Pueblo Motorway	250
Boston, Worcester & New York Railway	227

In a further reference to this important undertaking which we made in our issue of July 3, 1936, we pointed out that one of the important matters receiving attention was the provision of properly designed stations. Since then considerable progress has been made in this direction, and a new bus station recently opened at St. Louis, which is typical of the improved terminals now being provided by National Trailways, shows the very high standard of public facility which is being afforded on a nationwide basis as the result of the pooled experience of the constituent companies.

London Bus Drivers

IN a single year approximately 211,000,000 miles are run by the buses of the London Passenger Transport Board on the 1,269 miles of road over which the Central Bus services operate, and some 12,500 drivers are employed in providing this service. Since the early days of motorbus operation in London, the selection and training of drivers has been a matter to which every attention has been paid by those responsible for the management of the undertakings. In 1913 the London General Omnibus Company established a central training school at Chelsea, and this was transferred to the Chiswick works at the beginning of 1925. As part of a comprehensive re-planning and extension scheme at Chiswick to meet the modern requirements of the London Passenger Transport Board, a new building for the school and a new training ground for drivers have been provided; the latter is briefly described on pp. 1171-2. Before a prospective driver is considered qualified to take his place as a regular driver in the board's service, he is first interviewed with regard to his general suitability for the work, and must be able to show that he has had previous driving experience extending over at least two years, preferably in the London area. If he is accepted, he is medically examined to ensure that he conforms to the board's high standards

of physique, age, vision, and health. Having passed the preliminaries, he is given a course of training covering a period of up to 30 working days, according to his particular ability and adaptability; the average is 23 days. The severity of the various tests may be appreciated from the following figures which relate to the last twelve months. During that period 2,556 prospective drivers were interviewed, of whom fewer than one-half (or 41 per cent. to be precise) were accepted subject to medical examination. Of this number, 57 per cent. passed the medical examination and entered the training school. Some failed in the tests at the completion of their training and others during the period of probation, so that out of the 2,556 men interviewed only 576, or 22½ per cent. became regular drivers. Justification for this rigorous form of selection is found in the highly satisfactory safety records. Practically all the Central Bus drivers (last year 11,846 out of about 12,500) take part in the Safe Driving Competition of the London Safety First Council, entry to which is voluntary. Last year 8,635 drivers, or 73 per cent. of the entrants from the board's service, gained the council's award for freedom from blameworthy accidents. Of these, over 260 drivers qualified in that year for the council's gold medal for freedom from accidents for ten years; and over 450 others received the silver medal for five years' freedom from accidents. This is indeed a very fine record.

Stage Coaches on Rail

THE transport of private carriages by train in the early days of railways is a facility familiar enough from contemporary illustrations. A road transport operator in France in the 1840's, however, contrived a scheme which is less well known, but was of greater interest to the general public, when he introduced the conveyance of stage coaches by rail on the Paris-Orleans Railway, to avoid the transshipment of passengers and luggage at stations having road-rail connections. This pioneer, a M. Arnoux, arranged for the bodies of the stage coaches he operated to be readily detachable from the underframes, so that they could be transferred in a few minutes to a flat railway truck. For this purpose, gantries were erected across the railway lines, with a travelling hand winch on top which provided both for lifting and traversing the stage coach body. The accompanying illustration shows the arrangement in operation. During the transfer from road to rail and *vice versa*, passengers and luggage

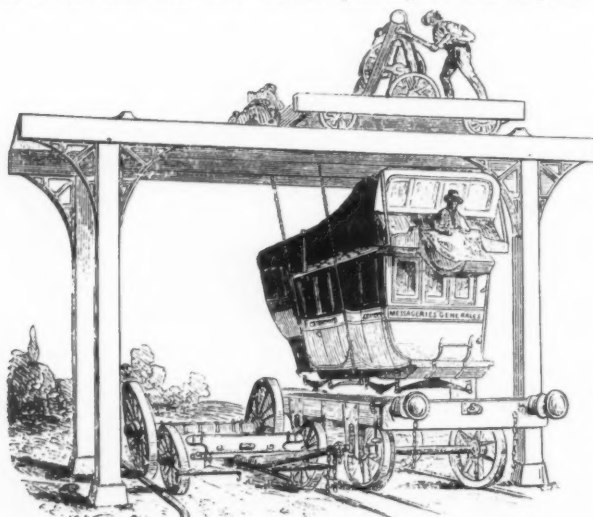
remained in the coach and were thus saved the inconvenience and occasional anxieties of changing. This system was instituted when the Paris-Orleans Railway was opened in 1843. From the time it was abandoned until road-rail vehicles made their appearance in recent years, corresponding "no-change" road *cum* rail journeys were confined to the transport of goods in containers.

Tilling-Stevens Limited

THIS well-known firm of commercial motor manufacturers had its origin over thirty years ago. Originally its speciality was a petrol-electric bus chassis which achieved considerable popularity by reason of avoiding many of the difficulties associated with early and comparatively inefficient forms of gear change. After the war the company added to its range four-cylinder and six-cylinder gear-driven petrol models and subsequently diesel-engined models for both passenger and goods work. The present company was registered on November 21, 1919, as Tilling-Stevens Motors Limited, and in August, 1930, the title was changed to T.S. Motors Limited. On October 21 last, just before the recent Commercial Motor Exhibition at Earls Court, the company changed its title once more and adopted the present form of Tilling-Stevens Limited, and, as will be recalled, exhibited under this name a comprehensive range of commercial motor vehicles including gear-driven and petrol-electric types; battery vehicles; and also the famous "pancake" engined chassis. A further extension of the company's activities is the recent acquisition of the manufacturing rights of Vulcan commercial vehicles. For the moment production is being continued at Southport, but eventually manufacture will be transferred to the Maidstone works, and the products will be marketed through a new company to be called Vulcan Motors Limited. The Vulcan Motor & Engineering Company is also an undertaking of more than thirty years standing, and in October last the entire share and debenture capital was acquired by J. Brockhouse and Company of West Bromwich.

Publications Received

Report of the Work of the London School of Hygiene and Tropical Medicine for 1936-37.—The report summarises briefly the questions which have occupied the attention of the school during the year. One of the matters of most topical interest, discussed in the report of the Division of Epidemiology and Vital Statistics, is a study of the incidence of sickness among transport workers. The question of gastric sickness among bus drivers and conductors was brought to the attention of the Medical Research Council in 1934, and it appointed Dr. Bradford Hill to be one of its representatives on a committee set up by the Industrial Health Research Board to investigate the problem. The inquiry was necessarily long and intricate, but a report summarising the results obtained was issued in July, 1937. Although this careful investigation was begun several years before the London bus strike of May last, no credit to it was given in the public discussion, and, on the contrary, it was suggested that only a strike leads to inquiry. It is, unfortunately, often the fate of research of this kind never to receive public appreciation. The report also contains numerous references to the results of research under the heads of Industrial Physiology and Medical-Industrial Psychology, in connection with which there appears to be an increasing tendency on the part of industrial organisations or firms to consult the Industrial Health Research Board, not only with regard to labour wastage, sickness absence, &c., at home, but also in respect of the improvement of working conditions in the tropics.



Sixth Annual Reports of the Traffic Commissioners

THE sixth annual reports of the Traffic Commissioners cover the twelve months from April 1, 1936, to March 31, 1937, and again reveal a continuation of the growth of passenger traffic in public service vehicles. The more important statistical details shown in the reports are reproduced in the accompanying table, from which it will be observed that new records have been established under almost every heading. The work of the Traffic Commissioners has certainly not had a restrictive effect upon the development of road passenger business, for the total number of journeys made during the year 1936 reached the remarkable figure of 6,426 millions, an increase of no less than 395 millions, or 6.55 per cent., compared with 1935. In other words, the daily average number of passenger journeys by road in 1936 was 17.6 millions, an increase of considerably over one million a day compared with 1935. The total revenue earned in 1936 was £65,567,151, an increase of £3,110,946 or 4.98 per cent. over the previous year.

Operators, Vehicles, and Seats

While the number of persons carrying on the business of operating public service vehicles declined from 5,351 to 4,991 in 1936, a decrease of 6.73 per cent., it is of considerable interest to find that the total number of vehicles owned at December 31, 1936, was 47,973, an increase of 1,463 or 3.15 per cent. compared with 1935; this is the highest figure recorded since the introduction of the licensing arrangements. The total number of seats rose to 1,671,664, an increase of 108,815 seats or 6.96 per cent. compared with 1935, while the average seating capacity of each vehicle was 34.85 as compared with 33.60 in the previous year. A further feature of the returns is the fact that greater work was obtained from each vehicle owned, as the average number of miles run on passenger services increased by 240 miles to 29,910 miles a vehicle. It is interesting to find that the local authorities (including joint local committees of local authorities and railway companies) are carrying a steadily increasing share of the business. Thus, while at December 31, 1936, they owned 15.51 per cent. of the total vehicles, they secured 27.96 per cent. of the total passenger journeys and 19.48 per cent. of the passenger revenue as against 18.61 per cent. in the previous year. The London Passenger Transport Board owned 13.63 per cent. of the total vehicles, secured 33.59 per cent. of the passenger journeys (as compared with 35.04 per cent. in 1935) and 24.82 per cent. of the total receipts as against 25.57 per cent. in 1935. The remaining operators owned 70.86 of the vehicles, secured

only 38.45 per cent. of the journeys but obtained 55.70 per cent. of the receipts as compared with 55.82 per cent. in the previous year.

Amalgamations and Absorptions

One of the consequences of the 1930 Act has been the absorption or amalgamation of a number of smaller operators by large concerns. The extent to which this has progressed is evidenced by the returns, which show that in six years the number of operators has dropped from 6,486 to 4,991. At the same time it is somewhat surprising to find that there are still 1,979 operators who own only one vehicle, 960 who own two, 663 who own three, 384 who possess four, and 594 who own from five to nine vehicles. The largest operator is the London Passenger Transport Board, which owns 6,537 vehicles, or 13.63 per cent. of the total, and the next largest fleet consists of 1,196 vehicles. Several of the commissioners refer to this tendency for larger concerns to take over smaller units, and point out that their responsibilities are increased thereby, as there is a danger that the interests of the travelling public may be prejudiced by the re-arrangement of services which usually ensues. Speaking generally, however, the commissioners are satisfied that the process has been in the public interest and that the larger concerns recognise their responsibilities in the matter of the provision of unremunerative services. The jurisdiction of the commissioners is now extremely wide, and their reports—which show a welcome tendency towards a more uniform style of presentation—cover such diverse matters as licensing of drivers, conductors, and vehicles; certification and examination of vehicles; enforcement of Acts and regulations; wages and conditions of service; co-ordination and fares.

Maintenance of Vehicles

Most of the commissioners refer to the continued improvement in the maintenance of vehicles, but in two areas the reports call for a higher standard of maintenance to be observed. It was necessary to suspend licences temporarily in over 2,000 cases during the twelve months under Section 71 of the Road Traffic Act, 1930, as the vehicles were not roadworthy. The West Midland Commissioner, in particular, remarks on this point that, whilst the maintenance generally continues to improve, there are fleets which are still working on far from modern systems of maintenance and are lacking in adequate equipment. He also makes the significant comment that the small operator is not the only offender in this respect and

SUMMARY OF OPERATIONS OF PUBLIC SERVICE VEHICLES, 1931-1936

Year	No. of operators	No. of vehicles owned	Average number of seats	Passenger Journeys (millions)			*Receipts (millions of £'s)				Vehicle miles (millions)	Average fare paid (pence)	Average receipt per mile (pence)
				Stage	Express and excursion	Contract	Stage	Express and excursion	Contract	Total			
1931	6,486	46,476	30.89	5,185.7	33.2	50.6	£50.9	£4.9	£2.9	£58.7	1,318.9	2.66	10.68
1932	6,307	46,458	31.65	5,263.1	34.5	47.3	£51.0	£5.0	£2.5	£58.5	1,323.7	2.61	10.61
1933	5,936	45,393	32.20	5,340.5	33.9	49.6	£51.4	£4.4	£2.6	£58.4	1,313.0	2.57	10.67
1934	5,746	45,795	32.71	5,635.8	32.5	53.8	£53.3	£4.3	£2.8	£60.4	1,345.8	2.52	10.77
1935	5,351	46,510	33.60	5,939.8	32.7	58.8	£55.1	£4.3	£3.1	£62.5	1,381.4	2.47	10.85
1936	4,991	47,973	34.85	6,327.8	34.5	64.1	£57.8	£4.4	£3.4	£65.6	1,430.6	2.44	11.00

* Includes receipts from conveyance of parcels, mails, luggage, and dogs:—

1931	..	£305,567	1933	..	£318,890	1935	..	£352,953
1932	..	£308,714	1934	..	£341,098	1936	..	£358,534

the members of the technical staff have still to give more attention than should be necessary to maintenance for the purpose of ensuring a reasonable standard of safety.

Enforcement

Despite the six years which have elapsed since the 1930 Act became law, it has been found necessary during the twelve months to institute proceedings in the Courts in over 1,500 cases for offences against the various Acts and regulations, and convictions were recorded in over 1,300 of them. The greatest number of offences relates to breaches of the conditions of road service licences, while large numbers were for driving in excess of speed limits and a substantial proportion in respect of overcrowding.

Fares

The commissioners report that, as the result of meetings between representatives of the commissioners, railway companies, and road operators, complete agreement has been reached as to the level of the road fares for the Manchester—London, Llandudno—Birmingham—London, and Birmingham—Portsmouth express coach services. These fare tables having been agreed, it can be said that the fare

tables for the whole of the trunk services operating from north to south have now been co-ordinated so as to be free from all double-booking anomalies—a decidedly useful piece of work. In order to complete the co-ordination of the fares for the whole of the express services operating through the East Midland area, there remains only the Cheltenham—Oxford portion of the Cheltenham—London service to be dealt with, and a few minor matters upon which early agreement is expected.

London Bus Turning Points

There is nothing of outstanding importance in the reports other than the opinion expressed by the Metropolitan Traffic Commissioner that the great congestion in the central area of London and the number of almost empty buses in operation there, make it extremely desirable that suitable provision should be made for turning points and possibly stations on the periphery of the central area. He urges, therefore, that the possibilities of the provision and use of bus stations should be the subject of a detailed enquiry from the geographical, financial, and traffic aspects, a recommendation on which the L.P.T.B. will doubtless have some fairly decided views to express.

Road Traffic Signals

THE instructive paper, "Street Traffic Signals with particular reference to Vehicle Actuation," which Mr. F. G. Tyack presented to the Institution of Electrical Engineers last month, shows how rapidly this new branch of electrical signalling has advanced since colour-light signals for regulating street traffic first appeared in London some 12 years ago. It is interesting to note that as long ago as 1868 a gas-lighted semaphore traffic signal was installed in Westminster, while of more recent years road signals have occasionally been used where special traffic conditions obtained, as at the Tower Bridge. The horse tramways in Liverpool had semaphore signals and points worked mechanically from a signal box at a busy crossing and junction, and the development of electric tramways led to several systems of single line automatic signals, using semaphores or lights. These signal systems were developed to a high degree of perfection in America especially for the interurban lines.

The earliest forms of traffic signal lights were manually operated and were followed by the fixed time interval system which, though tolerably satisfactory at some places, was found unsuited to general use, its operation bearing no reference to traffic requirements and thus tending to weaken confidence in the signals. Some improvement was made by apparatus enabling the time cycles to be varied to meet conditions at different hours of the day, but it was apparent that no satisfactory solution would be found without some means of making the traffic itself act upon the signal controlling mechanism. This was first achieved in the U.S.A., originally by apparatus responsive to the sound of motor horns—and hence clearly limited in application—then with the now familiar road pad device, or "treadle," which detects the passage of vehicles, their direction of movement, and speed. The first installation using them in Great Britain was opened in 1932. From then onwards rapid progress has been made in the construction of apparatus and the scientific study of traffic movement, density and flow, with the result that road signalling is now practically a distinct branch of transport engineering in the hands of specialists. The large installations brought into use at complicated street intersections in the last few years prove how much has been accomplished in these directions, and, as Mr. Tyack's

paper shows, there is already quite an imposing list of authoritative articles, papers, pamphlets, and books on the subject.

The paper deals fully with the principles of signal aspects, the construction and placing of signals, the use of special indications for pedestrians and trams, and gives a useful list of standard definitions covering the various features of traffic signal work now become essential, with an explanation of the basic principles of vehicle actuation, completed by circuit diagrams and illustrations of controller equipment. Certain apparatus already used in telephone engineering has been skilfully adapted to the work. Mr. Tyack discusses very clearly the problems arising from the right-hand turn and various forms of street intersection, showing how the elements in the apparatus act together to produce the most efficient results. The combination of the "first come, first served" and "fixed rotation" principles is particularly interesting, as is also the author's study of the operation of signals at a number of street intersections in a busy city, of which there are some remarkable examples in the West End of London and where an accurate investigation of requirements was first made with a view to facilitating the even flow of traffic. Here that ingenious appliance, the traffic integrator, plays an important part, as the very clear diagrams in the paper show, reminding one of railway headway charts, although the circumstances are fundamentally so different. So well have the principles of these "progressive" signal installations been worked out that vehicles are seldom stopped anywhere for long and can often proceed past a whole series of street crossings at a comfortable speed with no delays at all, while side road traffic is handled with reasonable expedition. "Too much emphasis," says Mr. Tyack, "cannot be placed upon the necessity for careful planning to determine the adjustments required to meet traffic conditions and for thorough testing under working conditions. However efficient the controllers may be, mechanically and electrically, they cannot play their part fully unless the progressive planning is suitable for the traffic with which the system has to deal"; while he gives as the test of a well-planned installation that "the streets should appear emptier than before the signals were brought into use."

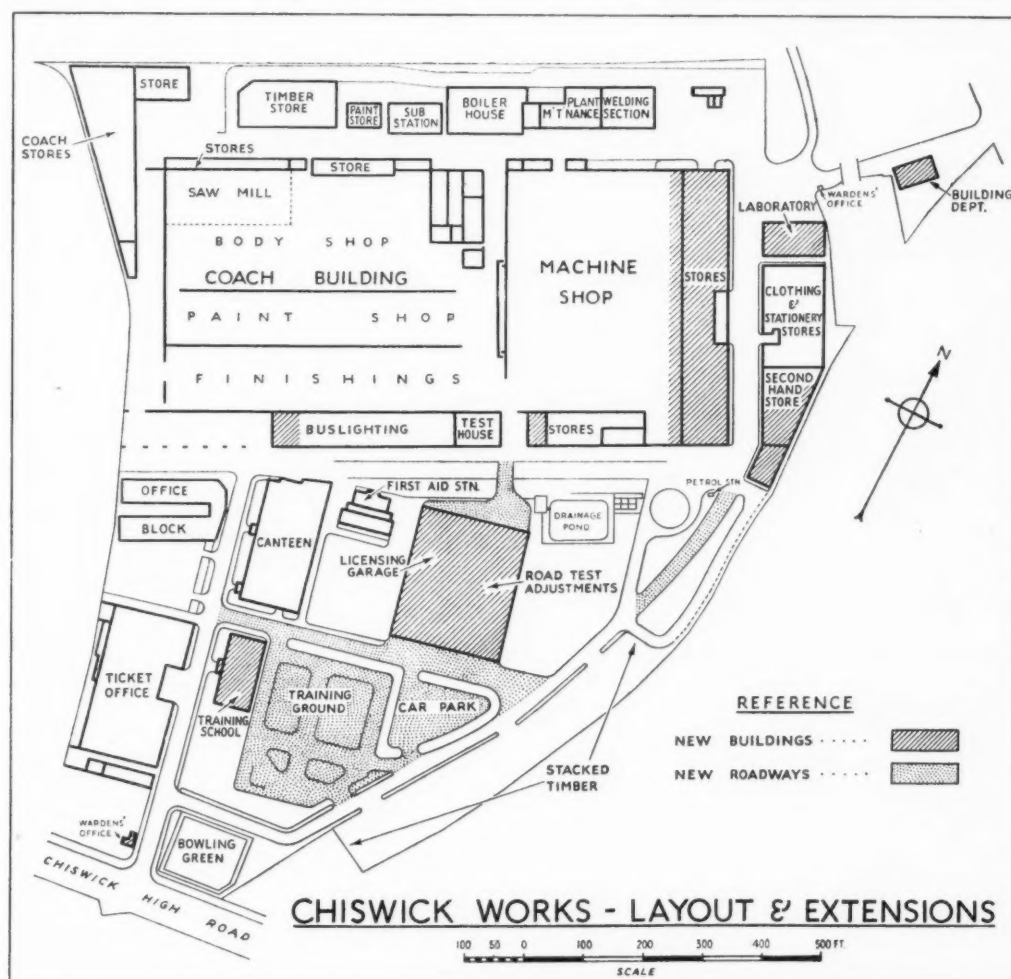
Chiswick Works Re-planning, London Transport

Alterations which are making this bus overhaul establishment by far the largest of its kind in the world—Details of the new training ground for drivers

IN 1920 the old London General Omnibus Co. Ltd. decided upon a policy of centralising and systematising the periodic overhaul of its fleet of buses, and in the following year erected the famous Chiswick overhaul works, now, of course, the property of the London

driven into the Chiswick works, dismantled down to the last nut and bolt, and returned to the road practically a new vehicle, in an average of three days.

The extent of the additions now in progress may be gathered from the accompanying layout. The works are



Passenger Transport Board. When the works were planned the fleet to be maintained consisted of 2,760 vehicles, and in 1929 when the works were extended and adapted the fleet to be overhauled and re-conditioned had grown to 4,000. Since the establishment of London Transport a drastic re-planning and enlargement has become necessary in order to cope with the considerably increased fleet of buses that has come into the board's hands. The guiding principle has been not only to make the works efficient for the overhaul on a progressive basis of the present fleet of approximately 6,400 vehicles—considerably larger in size and capacity than the earlier buses—but also to allow a substantial margin for future growth. Every London bus, after its allotted period of service, is

some 32 acres in area, and employ 3,500 men. When the present alterations are completed the establishment will be by far the largest of its kind in the world.

Only that part of the total cost which represents new or improved assets is properly chargeable to capital account, and alterations to existing assets (estimated at £100,000) are being met out of maintenance reserve. The latter, which provides a fund for extraordinary expenditure on maintenance falling outside current or normal expenditures, is built up by means of appropriations from revenue account, determined partly in relation to authorised commitments and partly to actual expenditure. The object, of course, is to level out, over a period, the incidence of any considerable burden. At June 30 last the balance

of this reserve amounted to £214,786, against which there were commitments of approximately £270,000, of which the re-planning of Chiswick works was the principal item.

The Training School

Apart from vehicle overhaul, another important department located at Chiswick works is the busmen's training school, and, as may be seen from the layout, the new works include a new building for the school and an entirely new training ground; these are on part of the land which formerly constituted the sports ground. The new training ground was formally inaugurated by the Minister of Transport on November 8, as recorded in THE RAILWAY GAZETTE of November 12. The first centralised training school of the L.G.O.C. was established in 1913 at Milman's Street, Chelsea, where a small driving instruction ground, 600 sq. yd. in area, was provided. This school survived until the end of 1924 and some 6,981 drivers passed through its training. At the beginning of 1925 the work was transferred to Chiswick where a driving instruction ground eight times as large (over an acre in extent) was provided.

This arrangement has continued up to the present, although the methods employed and the tests applied have been progressively developed on more scientific lines. Throughout the London area there have been many changes in road conditions in recent years. The road surfaces have been improved but, unfortunately, not standardised; traffic lights and pedestrian crossings have been introduced; and conditions generally have altered. The London Passenger Transport Board therefore decided to lay out a training ground which would incorporate features in keeping with conditions which the driver would experience on the London streets.

The new ground has a typical layout of crossover roads, each 30 ft. in width and having a normal camber of $4\frac{1}{2}$ in. The roads have three types of surface finish, namely,

special non-skid, unsanded asphalt, and sanded asphalt. The finish at the entrance to the training ground and at the end of the "straight" has a special non-skid surface; near the stop posts the surface is of unsanded asphalt. It is possible to train men in both dry and wet skid control. The sanded asphalt is used for the dry control, and the unsanded asphalt (sprayed with water if there is no rain) for wet control. There are traffic lights so that the drivers may be taught to approach them in such a way that they can obey a signal instantly without skidding. The stop posts are fitted with distant-controlled rubber arms with which the instructor may give a signal similar to that given by a passenger.

Prospective bus drivers, who must have had previous experience of driving heavy vehicles, are given a course of training, under the direction of skilled instructors, covering a period of up to 30 days, according to the ability and adaptability of the man concerned; the average period is 23 days. During this time the driver is instructed in the technique of bus operation, the mechanical features of motor vehicles, accident prevention methods, good road manners and the Highway Code, and concurrently, first on the training ground and later in the streets, in the proper driving and handling of the various types of buses included in the London Transport fleet. Throughout the whole period devoted to driving, his road sense is developed and his driving faults are corrected. His training completed, he is subjected to rigorous driving tests in the congested streets of Central London, and a final certificate is not given until the Chief Examiner is satisfied with both his technical ability and also his freedom from any bad driving habits which are liable to result in accidents. On passing out from the training school a driver is placed on probation for a period of three months, during which time his work is observed and carefully checked and he is given further instructions and advice when necessary. (See editorial note on page 1167).

Overseas Notes

Bedford Lorries for Afghanistan

For many years the north-eastern part of Afghanistan has been a very fertile cotton-growing centre, and the present Government has invested large sums of money in its development. Transporting the cotton rapidly and economically has provided a problem, as there is not a single mile of railway working in the Kingdom of Afghanistan. The run from Mazara-Shariff (the district where the cotton is grown) to Peshawar (the railhead in India whence it is dispatched to the port of Karachi for shipment) takes from seven to ten days over a route through a rugged and hilly country with primitive roads. It was estimated that to transport even what is now grown would require about 400 lorries, and the type of vehicle needed was one that would stand up to the arduous conditions of the frontier country. Accordingly, several makes were tried on experimental runs, and finally, after weeks of test, an initial order for 488 Bedford three-ton trucks has been placed. An experienced service engineer is being sent out to assist the Afghan Government to organise service stations and garages to maintain this large fleet, as well as to train local men who will be responsible ultimately for supervising the Governmental transport system.

Road Traffic Control in Ceylon

Quite apart from the heavy financial losses incurred by the Ceylon Government Railways as a result of uncontrolled road competition, the Executive Committee of Communications and Works under the Government, considers that the control of all forms of road transport in the island is imperative for the following reasons. From the point of view of public convenience, comfort, and safety, the present state of the road transport in Ceylon is intolerable. Passenger services are irregular; an owner will put his bus on or take it off

the road as he chooses. He can, and does, withdraw his vehicle from one to put it on another route which, for the moment, is likely to pay better. Racing for passengers often results in accidents with loss of life and limb, and, in the absence of third-party compulsory insurance, the injured and the dependants of the dead are made beggars for life, as it is seldom that any compensation can be recovered from the bus owners. Competition for passengers when carried to its logical conclusion leads to clashes between rival interests to obtain the monopoly of a route, clashes in which very often the innocent passengers are injured and sometimes killed.

Ceylon Railway Road Vehicles

Six new motor vehicles—two lorries and four vans—have been turned out by the Government Railway workshops at Ratmalana, Colombo, for the Railway Department's collection and delivery service. The new lorries are all on Morris Commercial chassis, and the bodywork only is built at Ratmalana; the woodwork is entirely of Ceylon woods. The bodies of the lorries have been specially designed for a container service which is contemplated in the near future. The entire hoods of these vehicles are detachable and the sides can be dropped down, leaving a flat truck on to which containers can be loaded by cranes.

The Bengal-Nagpur Railway and Road Services

Until the present time the transport activities of the Bengal-Nagpur Railway Company have been limited to running railways, but on December 9 an extraordinary general meeting of the company unanimously approved a resolution altering the memorandum of association of the company so as to permit running road motor services in India. The Chairman and Managing Director, Sir Trevredyn Wynne, recently expressed the view that India could not afford roads permitting high speed and heavy lorries, and he advocated roads acting as feeders to railways which the railways might assist in providing in lieu of branch lines.

G.N.R. Road Services in the Irish Free State

A fleet of 130 buses maintains 45 passenger routes, and 121 goods lorries feed the railway—The company is now manufacturing its own chassis at Dundalk works

THE Great Northern Railway (Ireland) occupies a unique position among Irish railways, as its main line forms the chief link between Dublin and Belfast—respectively the capital cities of the Irish Free State and of Northern Ireland—and the company has a considerable rail mileage on both sides of the border. Prior to October, 1935, the G.N.R. operated a comprehensive service of road motor vehicles for both passengers and goods throughout the area traversed by its rail services. In Northern Ireland, however, this position was fundamentally changed by the passage of the Road and Rail Transport Act (Northern Ireland), 1935. Under this Act all road services in Northern Ireland, including those of the Great Northern and other railway companies, but excluding those which operated on both sides of the Border, were merged in the newly-created Northern Ireland Road Transport Board. Twenty-one service routes operated by the Great Northern Railway were involved in the transfer; and the fleet taken over by the Road Transport Board comprised 50 passenger and 58 goods vehicles.

Legislation has also been enacted in the Irish Free State governing the operation of motor transport, but in a form materially different from Northern Ireland. Under the Free State Road Transport Act of 1933 the railway companies as "authorised" carriers were empowered to acquire the passenger and goods services of all "existing" carriers. With one or two unimportant exceptions this right of acquisition has been exercised by the G.N.R. in regard to the bus services in this area, and the undertakings so acquired have been merged with the company's previously-existing road passenger business. The latter was begun in the Free State in January, 1929, and formed the subject of an article in our issue of December 20, 1929. Today a fleet of 130 buses is maintaining regular services on about 45 routes, radiating principally from Dublin and Dundalk, and extending to Bundoran and Donegal in the west and Londonderry in the north. These provide road transport facilities in, and between, 150 towns and villages in the areas served by, and surrounding, the railway system. The bus services are co-ordinated with the rail, and a very full measure of interavailability of tickets exists between the two sections.

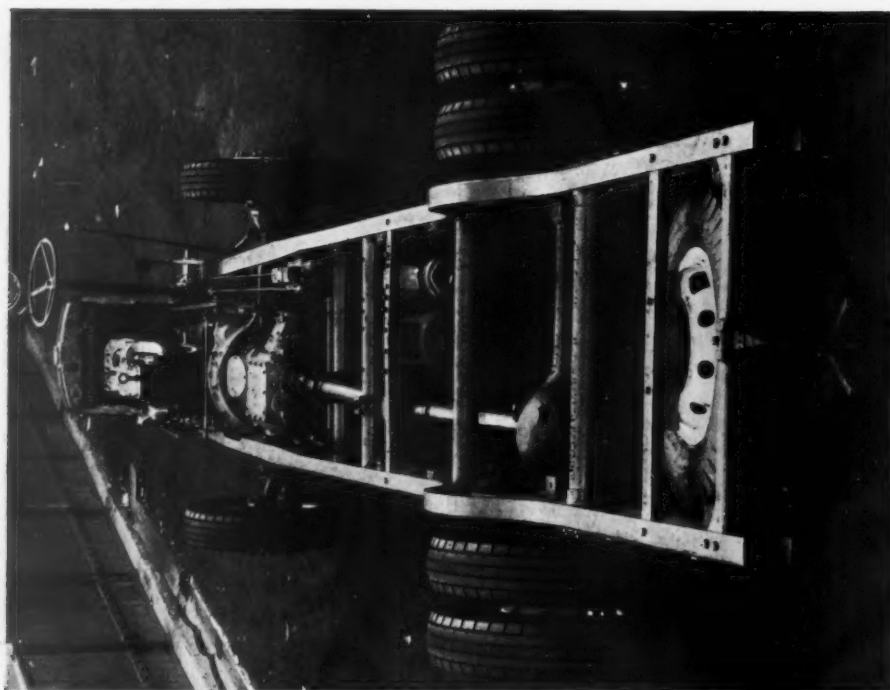
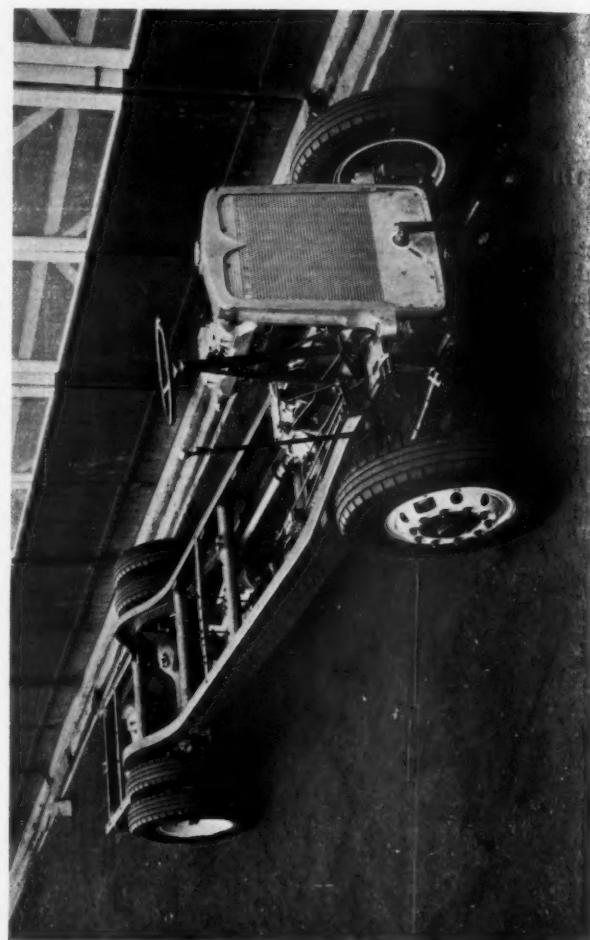
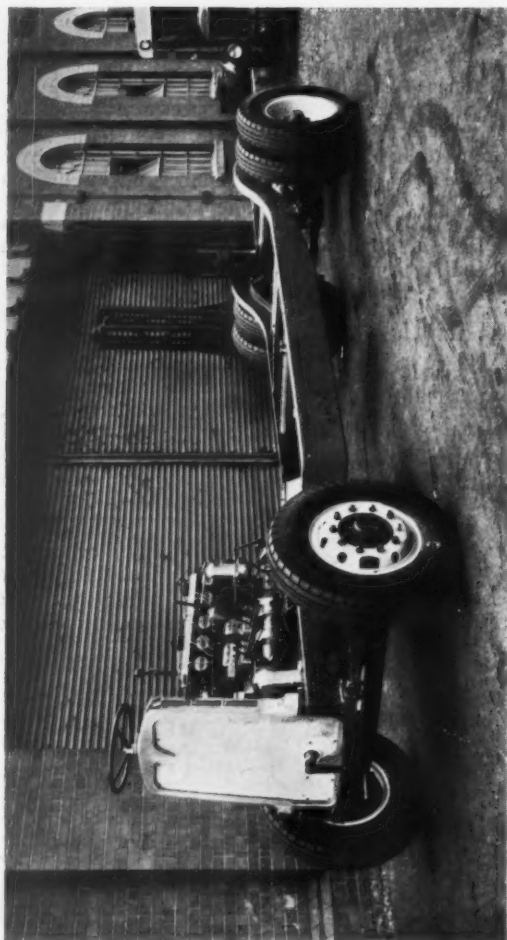
On the freight side the railway has also availed itself of the legislative powers of acquisition

with which it has been invested and the principal competitive haulage services have been taken over. It has been the policy of the company to use, as far as practicable, its rail services for the conveyance of goods between railhead stations and to employ the motor lorry services as connecting links to outlying towns and villages. In many cases these outlying districts are regularly served daily, or on certain days of the week, but where the volume of traffic available is small, services are given as required. Trunk freight services are maintained between all points where there is a demand and necessity for such.

A special Road Classification of Merchandise, drafted on broad simple lines and comprising only four classes, has been approved by the Railway Tribunal and statutory authority is now being sought for a Scale of Maximum Charges to fit that classification. An important and rapidly growing adjunct to the ordinary freight service is the furniture removal business. This is a branch of the service which has been developed only recently but



Sketch map showing the bus services of the Great Northern Railway



THREE VIEWS OF THE DIESEL-ENGINE BUS
 CHASSIS BUILT BY THE GREAT NORTHERN
 RAILWAY (IRELAND) AT ITS DUNDALK WORKS



One of the diesel-engined buses of G.N.R. build, with a 35-seat solid roof body

it has grown on a considerable scale, and both the direct road and the road-rail services are fully used in connection with it.

Composition of Fleet

The fleet of 130 buses consists of 70 petrol-engined and 60 oil-engined vehicles; most of the latter have been converted from petrol to fuel oil during the last three years. All these chassis are fitted with single-deck bodies, and it is only now that the double-deck bus is making its entry into the G.N.R. fleet. A few weeks ago the company bought for experimental purposes two double-deck A.E.C. Regent chassis and bodies which were assembled at the company's works. On October 17 these were placed in service on the Dublin-Howth route, and, if successful, the number of such machines will be greatly increased. Owing to the numbers of small operators taken over, no particular type of vehicle had been standardised until this year, when the company decided to build a chassis to its own specification. The present fleet is therefore somewhat varied as regards types and con-

sists of 82 Leyland, 19 A.E.C., 3 A.D.C., 9 Dennis, and 17 G.N.R.

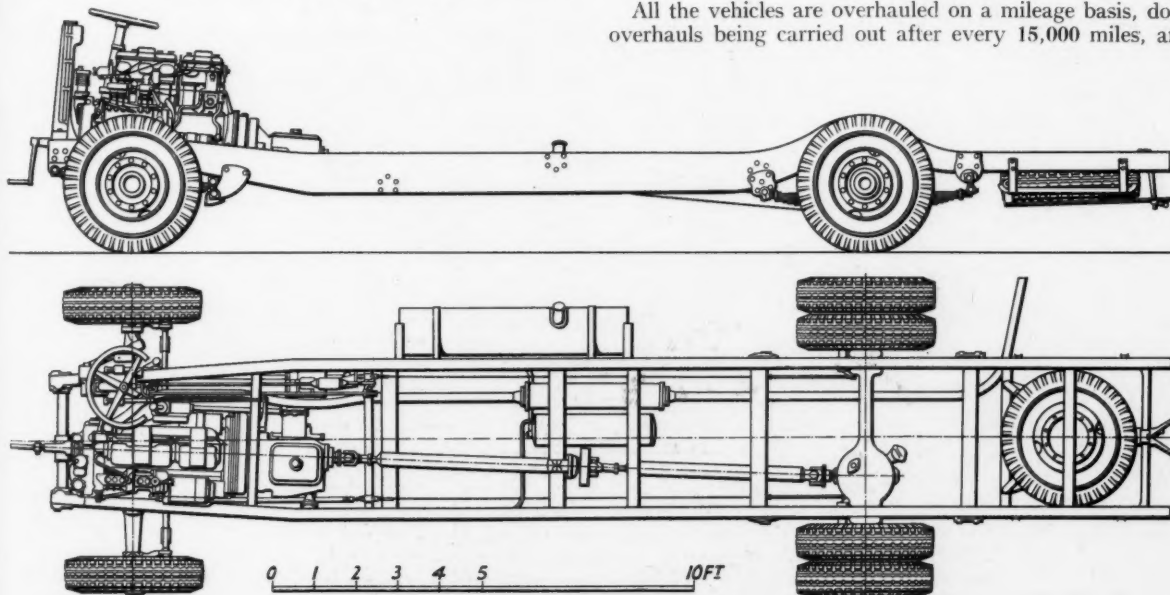
In the goods section of the fleet there are 121 lorries, practically all of which are fitted with petrol engines. This number is composed of Leyland, Albion, Morris-Commercial, Ford, Bedford, Beardmore, Federal, Dennis, Karrier, A.D.C., A.E.C., Commer, and Dodge makes.

The G.N.R. Chassis

The G.N.R. chassis mentioned above, and shown in the photographs and drawing reproduced, is completely assembled in the company's works, and fitted with the Gardner 5 L.W. engine and Meadows' four-speed gearbox. It has an R.A.C. rating of 36.5 h.p. and, at the maximum engine speed of 1,700 r.p.m., is capable of 45 m.p.h. Some of these chassis have been fitted with standard 35-seat solid roof bodies as shown in the accompanying illustration, while the remainder are fitted with 31-seat sun-saloon bodies.

Overhaul Methods

All the vehicles are overhauled on a mileage basis, dock overhauls being carried out after every 15,000 miles, and



Arrangement of the chassis built by the Great Northern Railway at Dundalk works

complete overhauls after 60,000 miles. When a complete overhaul is being carried out the body is removed, the chassis completely stripped and dismantled, and all working parts cleaned in a degreasing plant. The parts are then examined and tested for flaws, &c., in a magnetic crack detector. To avoid confusion, all parts to be scrapped are marked red, those for repair are marked yellow, and those in good order marked green.

Any worn shafts or pins are built up by a metal spraying plant which is also used for welding aluminium crankcases, gearboxes, radiators, and so forth. When all worn parts have been repaired, and scrapped parts replaced, the units are re-assembled and again fitted into the chassis, which has by now been cleaned and painted. Before replacing, the engine is run-in and tested for brake horse power, &c., on a Froude dynamometer. During this time any necessary repairs have been carried out and the body re-painted.

The repair shops are situated in Dundalk, where a section of the company's locomotive works has been converted for this purpose. These shops are very well fitted out, the equipment including two Froude dynamometers, two cylinder grinding machines, crankshaft grinder, cylinder honer, parallel shaft grinder, main bearing boring

machines, lathes, and drilling machines. Adjacent to these shops a body building shop has been constructed; this is used for building new bodies only. There is also an extensive sawmill, smithy, and machine shop.



Double-deck A.E.C. bus recently introduced into the G.N.R. fleet, and now in service between Dublin and Howth

Producer-Gas Bus in Scotland

THE Highland Transport Co. Ltd., a concern in which the L.M.S.R. holds 50 per cent. of the shares, has taken delivery of a 32-seater four-wheeled producer-gas passenger bus for service in the Dornoch district, and it is claimed that this is the first producer-gas bus to take up regular working in the British Isles. Built by Gilfords (H.S.G.) Limited, the vehicle incorporates the producer of the associated firm, High Speed Gas (Great Britain) Limited, as described in detail in the Road Transport Section of THE RAILWAY GAZETTE for July 30 last; but contrasted with the vehicles described in that issue, the producing plant is located at the rear end. The panelling surrounding the plant, and

the door giving access to the dust collectors, can be seen in the accompanying illustration. Cooling and cleaning are carried out underneath the chassis, and the front of the vehicle is in every way of the conventional type.

Starting up of the producer plant is effected by an electrically-driven exhaustor, according to the normal H.S.G. practice for commercial vehicles, but there is an extra fitting to ensure that during stand-by on prolonged stops the exhaustor is kept running slowly, thus keeping the producer plant in a gas-making condition ready for a quick start, even with a non-reactive fuel. The small amount of gas produced during these stand-by periods is burned off in a safe gas-burner, so that no poisonous fumes are exhausted into the atmosphere. As the gas-burner is in circuit at all times when the exhaustor is working, any inflammable gas which may appear is immediately burned, and the only poisonous element in the gas mixture at any point in the circuit is carbon monoxide, which is inflammable. As with the normal H.S.G. system, the exhaust of this Highland Transport bus is innocuous.

An A.E.C. 8-litre engine forms the propelling agency, and the drive is through a five-speed gearbox. The fuel consumption on anthracite and low temperature coke is in the region of 2 lb. a mile, and the water consumption 0.4 to 0.6 lb. a mile, varying according to the conditions met with in the normal service.



L.M.S.R. Horses

No fewer than 8,389 horses are in the company's service on cartage and shunting work—Some notes on the production of provender, and treatment of sick animals

A PERUSAL of Mr. H. W. Faircloth's paper (reproduced on page 878 of our issue of November 19) demonstrates clearly even to those unfamiliar with close details of railway cartage operations that the utility of the horse in providing the motive power for road freight vehicles is by no means at an end. The evolution of the mechanical horse has resulted in considerable acceleration in the process of mechanisation during the past five years, and the total effect of the last decade on the cartage strength of the four British main-line railways has been an increase of 6,252 motors and a decrease of 5,352 horses. Nevertheless, the process of conversion is unlikely to reach the stage of eliminating the economic value of the horse until a motor unit is devised which can show working costs on a parity with horse unit cost, always excepting the possibility of new legislation barring horse traction from the streets of large cities.

At the beginning of the present year the four main-line railway companies had a total stud of 13,635 horses for cartage and shunting work, of which no fewer than 8,389 were in the service of the L.M.S.R. As with their mechanical counterparts, horses require regular "fuelling" and occasional "overhaul" and the following notes outline the activities of the L.M.S.R. in these important but little known sidelines of railway operation. So far as food is concerned, the L.M.S.R. manufactures provender for its horses at its own four mills, situated at Camden (London), Oakham (Rutland), Manchester, and Glasgow. The output of the English mills amounts to 37,336 tons per annum, which normally is railed direct



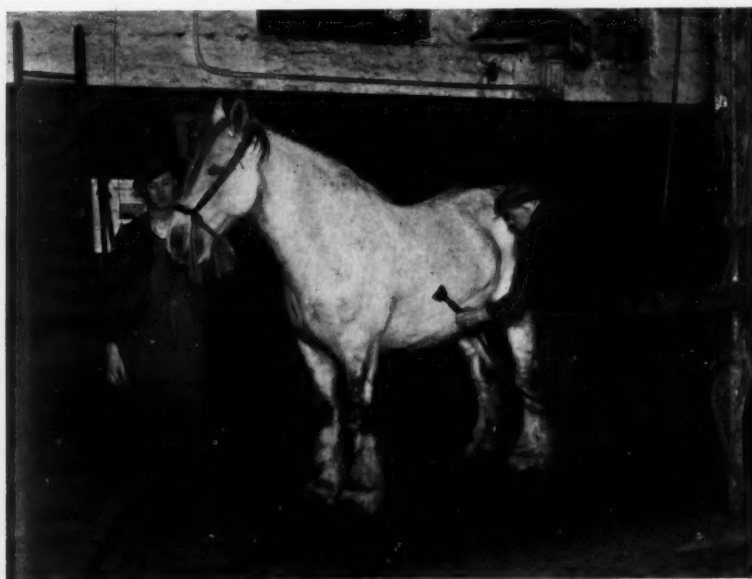
Horse-drawn depot sorting dray with automatic coupling

from the mills to the principal horse depots. Incidentally, London horses are the largest eaters, and, despite their rural surroundings, country horses do not have so large a ration as those working in the City. The London railway horse, in fact, is allotted 14 lb. more a week than its country cousin.

Every year contracts are placed by the Stores Department, which is responsible for the mills, for large quantities of British hay, straw, grain, and bran, to the company's requirements and subject to exacting inspection on arrival. Most of the hay is purchased in the Home Counties, but last year, owing to the failure of the home crop, it was found necessary to obtain stocks of Canadian hay in order to maintain the standard of provender. The work of the mills is to turn out a feed to the specifications and satisfaction of the Horse Department. The latter, after extensive experiments, has selected standardised feeds for the three different types of horses in the company's employ. The amount of feed varies slightly according to the type of horse and the classification of the work it performs. Although the quantities of feed vary slightly, the main constituents are the same. The additional amount given to the London horses is made up of oats.

A Modern Provender Mill

The methods of production at all the L.M.S.R. mills are on similar lines, but that at Oakham, which is one of the



Clipping a horse in King's Road stables, St. Pancras

most up to date in the country, may be taken as a good example of modern practice.

The Oakham mill, which belonged to the old Midland Railway Company, employs a staff of 40 men in the manufacture of the provender. In addition, ten men look after the engines which provide the electrical power for driving the machines and lighting the building, and also man the fire engine. The latter consists of two steam-driven pumps which can call upon a reservoir containing 280,000 gall. for their water supply; a system of sprinkler pipes is also installed. The generating plant will shortly be displaced, and the electricity for all purposes purchased from the local authorities.

The mill possesses rail-connected sidings and is particularly well equipped for dealing with both inward and outward traffic. Ten capstans facilitate wagon movement, and the supply and demand is so regulated that the minimum number of empty wagons is on hand. The hay and straw, which is trussed and in bundles, respectively, is transported from the wagons to four cutting machines, and duly cut into chaff of about $\frac{1}{2}$ in. lengths.

It is then passed through a system of elevators to the various floors where the chaff is cleaned before it is mixed with the maize and oats, which meanwhile have undergone similar cleansing treatment and crushing. The provender is finally weighed collectively and bagged. It has been ascertained that, as a result of this process of elimination, four tons of dust are extracted from every 190 tons of hay cut into chaff. Electro-magnets quickly detect nails and other pieces of metal which may have crept into the raw material.

A feature of the operations from an efficiency standpoint, is that the provender is practically untouched by hand from its receipt in the raw state until its departure as the finished article. The blending is performed automatically by machinery, which ensures every sack being filled with a mixture of the various commodities in their correct proportions, and the provender is then tipped into the bags which, after being tied, are conveyed by endless belt and placed in the wagons for dispatch.

Every week Oakham dispatches 7,600 bags, containing a total of 374 tons of mixed provender. This is distributed in 110 wagons to an area extending as far as Bristol in



A collar to prevent a horse biting and aggravating sore places that have been treated

the west, taking in part of London, and going as far north as Leeds. The weekly outputs of the Manchester and Camden mills are 209 tons and 135 tons respectively.

The Willesden Sanitarium

The efforts of the L.M.S.R. in running its own mills, in order to produce scientific feeds for its horses, is well repaid in the fitness of the animals and in their comparative immunity from serious illness and breakdown. It is impossible, however, to eliminate all ailments, and the company maintains at Willesden a well-equipped horse sanitarium and a special "nursing" staff. On an average 80 cases a week are dealt with here, and fewer than 2½ per cent. fail to respond to the varied treatment, which includes such features as mud baths and special diets.



*Above: The horse foot-bath at the Willesden Sanitarium
Left: A horse being treated for blisters on the forelegs*

Progress of the Reichsautobahnen

Within four years of the inauguration of the scheme, 965 miles were opened for traffic. Plans have now been extended to comprise 5,500 to 6,000 miles

INTEREST in Great Britain in the progress of the German motor roads, or *Reichsautobahnen*, has been considerably quickened during recent months as the result of a visit to Germany of a British delegation. The party comprised 224 members and the visit was arranged jointly by the Royal Automobile Club, the Automobile Association, and the British Road Federation. This delegation included members of both Houses of Parliament, county councillors, road surveyors, and representatives of various associations, under the honorary secretaryship of Mr. R. Gresham Cooke. The party left England on September 25 and returned on October 3, during which time the members inspected some 545 miles of *Reichsautobahnen* as guests of Dr. Todt, Inspector General of the new German road system.

It will be recalled that the first sod of these German national highways was turned by Herr Hitler on September 23, 1933, and the first section of road—the 22-km. (13·67-mile) length between Frankfort-on-Main and Darmstadt—was formally opened on May 19, 1935. By mid-September, 1937, after four years of work, 18 *Reichsautobahn* sections totalling 1,552·9 km. (965 miles) were open for traffic. There are 1,652 km. (1,026·5 miles) in construction and plans and arrangements for construction have been made for 2,014 km. (1,250 miles) more. By the end of 1937 more than 2,000 km. (1,243 miles) of these highways will be open to motor traffic, and about 1,000 km. (621·5 miles) will follow yearly. The whole network, amounting to 6,900 km. (4,287 miles), is expected to be completed by 1942. Since this estimate was published, however, the scheme has been further extended, for, at the beginning of November, Dr. Todt announced that the road network will ultimately comprise between 5,500 and 6,000 miles.

The following figures, taken from Volume No. 18, 1937, of the official publication *Wirtschaft und Statistik* (Economics and Statistics), give an idea of the enormous

amount of technical and manual labour put forth in the 4 years.

Number of Persons Employed

The construction of the national motor roads, of which one of the primary objects was the relief of unemployment, occupied some 250,000 workpeople in the first year or two, directly or indirectly. The lack of skilled men, and even untrained ones, since the unemployment crisis declined, has led in the present year to a large use of road making machines, so that the highest number employed in 1937 was 100,860, or 23,623 fewer than for 1936.

TABLE I.—AMOUNT OF WORK ACCOMPLISHED

Working days completed	82,314,000
Surface dug	40,704,000 sq. m.
Earth removed	104,766,000 ..
Earth and rock moved	189,450,000 ..
Road surfaces laid	32,917,000 ..
Cement	25,450,000 ..
Tar and bitumen	2,845,000 ..
Stone slabs	2,700,000 ..
Various	1,923,000 ..
Materials supplied for use down to September 1, 1937:—		
Cement	3,050,000 tonnes
Gravel and sand	13,346,000 sq. m.
Broken stone	3,834,000 tonnes
Paving stone	962,000 ..
Quarry stone	2,673,000 ..
Iron and steel	397,000 ..

Cost of the Work

By August 1, 1937, orders worth 1,700 million RM. had been placed and payments to the value of 1,400 million RM. made, while purchase of ground, interest, freight charges and management had cost 333 million RM.,



The Mannheim-Frankfort-Heidelberg triangle looking towards Mannheim



Reichsautobahnen bridge across the Elbe on the Berlin-Hanover Road

84 millions being for the first item. Total expenditure on the highways by that date was about 1,700 million RM.

Bridges

There is on the average a bridge of some sort for every 750 m. (820 yd.) of road, so that between 10,000 and 14,000 bridges and culverts have to be built, of which, of course, the great majority are small works (costing under 100,000 RM. each). By the end of August, 1937, 3,223 bridges and culverts were completed and 881 were under construction or being designed; among them were 117 bridges of fair size, costing over 500,000 RM. each. Table II shows the largest bridges completed or under construction.

TABLE II

Bridge	Road	Length	Maximum height
Stone :—		Metres	Metres
Over the Saale, near Jena	Chemnitz-Eisenach ..	751	21
Elstertal ..	Chemnitz-Plauen-Naila ..	680	61
Sieg ..	Cologne-Frankfort (Main)	400	10
Göltzschthal ..	Chemnitz-Plauen-Naila ..	394	35
Over the Ilm, near Mellingen	Chemnitz-Eisenach ..	383	17
Re-inforced Concrete :—			
*Over the Elbe near Hohenwarthe (steel portions also)	Hanover-Berlin ..	1,170	15
Frankenhausen ..	Dresden - Chemnitz - Weimar	491	19
*Over the Neckar	Frankfort (Main)-Heidelberg	391	16
*Over the Danube	Stuttgart-Ulm ..	359	18
*Saubachtal ..	Dresden - Chemnitz - Weimar	261	18
Steel :—			
*Valley near Rudersdorf	Berlin Circular (East) ..	738	19
Over the Havel ..	do. do. (West) ..	704	22
*Neandertal ..	Cologne-Düsseldorf ..	540	21
*Freiberg Mulde	Dresden-Chemnitz ..	403	70
*Mangfall ..	Munich-German frontier ..	319	68

* Completed

The most expensive bridge so far is that over the Elbe, near Hohenwarthe, costing about 5.5 million RM., and it is also the longest, 1,170 m. (1,280 yd.).

The road built this year from the mediæval city of Worms on the Rhine to the valley of the Main has been named the Nibelung Road, on account of the associations of this district with the famous legend. A second road which is being constructed through the Odenwald from Heppenheim to Erbach is to be called the Siegfried Road. It will pass close by two springs associated with the Siegfried legend, one at Heppenheim and the other at Gras Ellenbach where Siegfried is reputed to have been killed by Hagen while drinking from its waters.

New Sections

Since the completion of the four-year period to which the above-quoted statistics apply, various further sections of road have been brought into service. The first stretch of the German State motor road to cross the Saar Palatinate was opened at the end of October. This road, 18 miles in length, passes over the higher wooded region of the Palatinate and four bridges have been built to carry it across the intervening valleys. Those crossing the Waschmühl and Lauter valleys are among the largest bridges constructed for the State motor road system. The 14-mile stretch of the German *Reichsautobahnen* from Siegsdorf to Piding in Bavaria which was opened to traffic last month, is probably the most beautiful section in the whole system of State motor roads. It travels through the heart of the Bavarian Alps and at one point is 2,000 ft. above sea level.

WHAT'S THE ATTRACTION?—In the course of our article on the British Electrical Federation (published in our issue October 22 last) we pointed out that the advertising department of this extensive organisation handled the letting of spaces on road transport vehicles of its member companies, and dealt directly with national advertising emanating from the London area. To assist in this work the Federation produces an excellent brochure entitled "What's the Attraction?" of which we have recently received the new edition. With its many valuable pieces of information this constitutes not only a useful guide for potential advertisers but also a handy work of reference.

THE FEDERATED MALAY STATES RAILWAYS

A correspondent describes their history, organisation, traffic, equipment of all kinds, and docks

THE Federated Malay States Railways are maintaining their reputation for up-to-date organisation and services, as we noticed during a recent visit. The management provides excellent services for business men and tourists between the important capitals and ports in the peninsula, and with the Kingdom of Siam, in conjunction with the Royal State Railways of Siam.

The F.M.S.R. system serves a population of 6½ million, spread over an area of 104,693 sq. miles in the Federated Malay States, the Unfederated Malay States, British Malaya, and the Straits Settlements. The first section was opened in 1885, from Port Weld to Taiping, and in 1901 the separate States sections were brought under central management. The characteristics of the system are a long main line from south to north through the peninsula, from Singapore to the Siamese border, 580 miles, with short branches to the ports on the Straits of Malacca; and an East Coast line to Tumpat, on the China Sea, also giving a connection with the Siamese railways. The total mileage is 1,067, all single track with the exception of the Prai-Bukit Mertajan section (the Penang branch), 6½ miles, and about 3 miles north and south of Kuala Lumpur, which are double track, the former to cope with the goods traffic to Penang, the latter for suburban traffic. Second track and sidings total 254 miles.

Organisation and Traffic

The headquarters of the system are at Kuala Lumpur, capital of the Federated Malay States. Under the General Manager are seven departments, the Chief Engineer's, Transportation, Chief Mechanical Engineer's, Chief Accountant's, Stores, Police, and Health Departments. The Transportation Department is sub-divided in two divisions, the Western based on Kuala Lumpur, and the Midland on Gemas. The Chief Engineer's Department has six districts for maintenance and new works, and a Signal Engineer's Department. Locomotive running is under the Transportation Manager.

The principal products of the territory served by the system are tin and rubber, and the railways' prosperity is greatly influenced by the trend of the trade in these products. The world trade depression had an extremely serious effect on the rubber and tin trade, and as a result the railway receipts declined by no less than 61 per cent. during four years from 1929 to 1933. In the same period the management succeeded in reducing working expenditures by 40 per cent., and only the years 1931, 1932 and 1933 show deficits. Since 1934, when a trade recovery occurred, the system has been paying its way again, notwithstanding increasing road competition, and this fact is well worth particular attention as it confirms strikingly the experience of railways in other parts of the world that the depression far more than new road competition was the principal cause of decreasing railway revenue.

Track, Buildings, and Equipment

It is at once noticeable that the management and the staff take special pride in keeping the line, stations, trains, and equipment scrupulously clean, and the staff is trained in giving efficient and courteous service. The headquarters offices, station, and hotel opposite, at Kuala Lum-

pur, are among the sights most admired by the many tourists visiting this beautiful capital. The permanent way on this metre-gauge railway is kept up to high standards; 80-lb. rails on local hardwood sleepers, and stone ballast are standard on the main line and the important branch lines; 60-lb. rails and sand ballast are used on the branch lines with light traffic.

Locomotives and Rolling Stock

The amalgamations of the various State systems, the years of the war and its aftermath, and the world trade depression have been a serious handicap in the standardisation of the rolling stock, but a good deal has been accomplished in this direction. Three-cylinder 4-6-2 engines with 8-wheeled tenders continue to show creditable



Singapore station. Arrival platform, left; departure, right

performances on the express and mail trains, and also on the principal through goods trains. The first three engines of this type, the "S" class, were built by the North British Locomotive Co. Ltd., and were placed in service in 1928. They were described in THE RAILWAY GAZETTE of May 18, 1928. A further batch of eight of the same class was ordered from Beyer Peacock & Co. Ltd. in 1930, and was described in THE RAILWAY GAZETTE of June 26, 1931. The last order for five engines was placed with Beyer Peacock in 1932; these engines have a new type of cab with sun screen, smoke deflectors, the R.C. poppet valve mechanism, and a larger tender.

For the important branch lines 4-6-4 tank engines, styled "C" class, were introduced in 1930; these were built at the works of Nasmyth Wilson & Co. Ltd., and were described in our issue of November 7, 1930. All these engines are used on the principal locomotive turns, and double-heading is exceptional nowadays. A special feature of the locomotive running is that for the principal trains this is centralised at Kuala Lumpur shed, an arrangement that has led to drastic reductions in running expenditure; it involves daily turns of 500 miles for the engines working the expresses between Kuala Lumpur and Singapore.

The newest passenger stock consists of first, second, and third class coaches, dining, sleeping and buffet cars, luggage and mail vans. The metre gauge has caused some difficulties in finding the most suitable and comfortable

construction, more particularly with regard to the width of the coaches and the springing of the bogies. The standard finally adopted is an open type coach with end entrances, and having a maximum width of 9 ft. 0½ in. at the waist, below the windows, slightly less at the top, and about 7 in. less at floor level. This gives the vehicles a modern and neat appearance. In the design of the bogies the Siamese practice is followed; a wheelbase increased from 5 ft. 6 in. to 6 ft. 6 in., and the introduction of transverse springs and coil springs at both sides of the bogie frame have improved the running, and this type is now standard. All passenger vehicles are lighted by electricity. The under-carriages are imported from Great Britain, the bodies, of excellent local timber, mostly teak, are made at the workshops at Sentul, just north of Kuala Lumpur, Chinese labour being employed. Two of the latest vehicles are air-conditioned and were detailed in the RAILWAY GAZETTE of November 20, 1936.

Articulated all-steel twin railcar sets, two carriages on three bogies, have been introduced to compete with road traffic over short distances, apparently with satisfactory results. Opinions appear to be divided as to whether the all-steel construction is suitable in the tropical climate of the Peninsula.

Train Services

The principal trains are the up and down day and night expresses daily between Singapore and Prai (Penang), which cover the distance of 488 miles plus the ferry from Prai to Penang in 20 hr., and 22 hr. 30 min. respectively in one direction, 20 hr. 45 min., and 22 hr. in the other. In connection with these trains through expresses are run between Prai (Penang) and Bangkok, the Siamese capital, twice weekly, in 27 hr., a distance of 715 miles. These trains have through sleeping carriages from Kuala Lumpur to Bangkok and back. A good service of local and mixed trains is maintained on short sections. Most of the goods traffic is conveyed during the night, and throughout most of the system goods are delivered the morning after the day they have been ac-



Port Swettenham passenger station

cepted. The administration has instituted collection and delivery by road services at all principal centres.

Ports Served by the Railways

The principal ports, Singapore and Penang are both on islands. Penang is served by railway-operated ferry boats for passengers and goods, and Singapore was, up to 1933, reached by rail via a wagon ferry across Johore Straits. In September of that year the new causeway, 1,155 yd. long, built through an average depth of water of 47 ft., was opened for rail and road traffic. It carries a single line, but space has been reserved for a second track. The port of Singapore is owned and operated by the Harbour Board, and the railway runs sidings to the various docks and wharves. At the other ports in the Peninsula the railway administration has constructed its own wharves and piers.

Port Swettenham, the port for Kuala Lumpur and district, is well equipped with wharves, jetties, sidings, modern sheds, and electric cranes for the handling of cargo for ocean steamers. Prai and Penang are equally well equipped and various smaller ports give all the accommodation needed for the exchange of cargo between ship and train. The only port on the east coast served by the railway is Tumpat. Shallow water inside the bars prevents the development of large ports on that coast. Perhaps the most extensive works in connection with the development of traffic facilities between ocean ships and railway have been those for the deviation, in 1932, of 8½ miles of the main line in Singapore Island. The line now runs along the outskirts of the town to its terminus alongside Keppel Road, just opposite the Empire Dock. This deviation was described in our issue of November 18, 1932.

The application of modern practices on the F.M.S.R. is further manifest in various other departments such as electric signalling and colour-light signals at Singapore, central train control from Kuala Lumpur, mechanised accounting, and training schools for the staff. A special feature also is the housing of practically the entire staff in railway-owned houses and bungalows.



Port Swettenham goods yard

RAILWAY NEWS SECTION

PERSONAL

Mr. G. G. D. Hill has been appointed Assistant Private Secretary to the Minister of Transport.

Mr. J. F. Brook, who retires on December 31 from the position of District Passenger Manager, Birmingham, L.M.S.R., entered the service of the London & North Western Railway in the Traffic Superintendent's Office

Mr. G. R. Bradbury, who, as announced in our issue of December 10, has been appointed District Passenger Manager, Birmingham, L.M.S.R., in succession to Mr. J. F. Brook, entered the service of the former London & North Western Railway as a junior clerk at Kensington (Addison Road), London, in April, 1895. He was appointed to the District Superintendent's Office, Euston, in 1899, and to the office of the Superin-

We regret to record the death on December 10 of Mr. A. J. Brickwell, C.B.E., Estate and Rating Surveyor, Southern Area, L.N.E.R., from 1923-35. Mr. Brickwell died in the Victoria Cottage Hospital, Barnet, on behalf of which he had been an active worker since his retirement, being Honorary Director of Appeals and organising in its aid the successful exhibition of L.N.E.R. rolling stock at New Barnet reported in our issue of June 11. Mr.



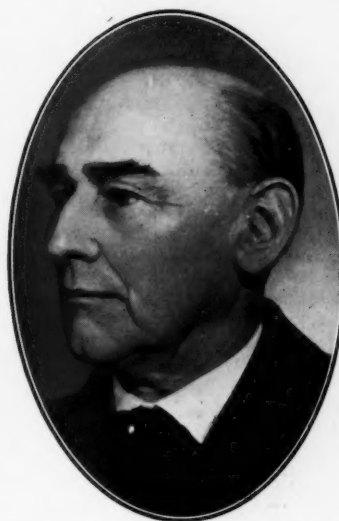
Mr. J. F. Brook

District Passenger Manager, Birmingham, L.M.S.R., 1932-37



Mr. G. R. Bradbury

Appointed District Passenger Manager, Birmingham, L.M.S.R.



The late Mr. A. J. Brickwell, C.B.E.

Estate and Rating Surveyor, Southern Area, L.N.E.R., 1923-35

at Euston in June, 1892, and after experience in various parts of the line in both Passenger and Goods Departments became Trains Clerk, Office of Superintendent of the Line, Euston, in September, 1909. Mr. Brook has been at Birmingham since July, 1913, when he was appointed Outdoor Assistant to the Passenger Superintendent, Birmingham. In April, 1925, he became Passenger and Parcels Agent, Birmingham, and in October, 1931, Assistant District Passenger Manager, Birmingham; he was appointed District Passenger Manager, Birmingham, in June, 1932.

From *The London Gazette* of December 7: Territorial Army, Royal Engineers, Engineer & Railway Staff Corps: Lieut. John Blumenfeld Elliott, Reserve of Officers, to be Lieut.-Col. (October 30).

Dr. Todt, the Inspector General of the Reichsautobahnen (German Motor Roads), has been awarded a *grand prix* for public service by the International Jury of the Paris Exhibition.

tendent of the Line, Euston, in 1906. Mr. Bradbury served with H.M. Forces from 1915-1920, and upon the formation of the L.M.S.R. in 1923 became successively Assistant Chief Claims Clerk and Chief Traffic Development Clerk, in the General Superintendent's Office. Subsequently he held the positions of District Passenger Agent at Leicester (October, 1928), and at Nottingham (October, 1931). In September, 1932, Mr. Bradbury was appointed Assistant to the District Goods and Passenger Manager, Derby, which position he now vacates to take up his new appointment.

The Secretary of State for the Colonies has recently approved the following appointments:—

Mr. J. W. Lewis, Maintenance and New Works Engineer, to be Chief Engineer, Way and Works, Federated Malay States Railways.

Mr. L. E. Stevenon, Senior Traffic Assistant (Headquarters), Railway Department, Nigeria, to be Traffic Manager, Tanganyika Government Railways.

Brickwell entered the Surveyor's office of the former Great Northern Railway as a pupil under Mr. W. H. Elwell, and on Mr. Elwell's retirement in 1903 was appointed Surveyor to the G.N.R. as his successor. From 1918 to 1920 he was appointed Director of Cold Storage for the British Isles by the Minister of Food, and received the C.B.E. in 1921. In that year also he was appointed by the Minister of Transport a member of the departmental committee to consider the situation which would arise as regards the valuation for local rating purposes of railway undertakings in England and Wales, and Scotland, due to the amalgamations provided for in the Railways Act, 1921. Mr. Brickwell was a Fellow and Member of the Council of the Chartered Surveyors' Institution; a Fellow of the Auctioneers' and Estate Agents' Institute and the Land Agents' Society; a Past President of the Rating Surveyors' Association; and a Member of the Parliamentary and other committees of the Surveyors' Institution. Since 1912 he had been Correspondent of the Association of Railway Rating Surveyors,

and on several occasions had been Chairman of the Estate Agents' Conference of the English and Scottish Railways. Mr. Brickwell was a member of the Barnet County Council for the Brunswick Park Ward of East Barnet. He always took a keen interest in the Great Northern Railway Athletic Association, of which he was one of the founders in 1890, and had been a captain of the football and cricket sections. For many years Mr. Brickwell held the position of Chairman of the General Committee of the association. The funeral service was held at Barnet Parish Church on Tuesday (see page 1188).

Mr. W. Gordon Bradley, B.A., has been appointed Solicitor to the Great Southern Railways, Ireland, in succession to the late Mr. John McDonald.

A special tribute was paid by the Irish Railway Tribunal recently to the memory of the late Mr. John McDonald, Solicitor to the Great Southern Railways, who died in September. Judge O'Brien stated that Mr. McDonald had been very frequently engaged at the proceedings of the tribunal, and he was a man possessing the highest gifts of head and heart, a distinguished member of his profession, and a lovable personality. He regarded the passing of Mr. McDonald as a personal loss. Mr. Phelps, K.C., on behalf of the Great Southern Railways Company and the members of the staff, said that Mr. McDonald had left behind him a splendid memorial of service. Mr. John O'Brien, formerly Registrar of the tribunal, and now representing the Department of Industry and Commerce, associated himself with the tribute. Mr. P. J. Floyd, Traffic Manager, Great Southern Railways, represented the officers of the company on this occasion. Mr. McDonald, who was appointed Solicitor to the Great Southern Railways in 1928, transacted the business both of the railways and their ancillary services.

We learn with regret of the death at Clacton on November 30 of Mr. Frederick William Reed, who retired from the position of Assistant Telegraph Superintendent, Southern Area, L.N.E.R., on October 31, 1936; his health had been indifferent for some time. Mr. Reed was born in 1874 and served an apprenticeship at the Horwich works of the former Lancashire & Yorkshire Railway, joining the Telegraph Department of the then Manchester, Sheffield & Lincolnshire—later Great Central—Railway at Godley in 1895. In 1913 he was made Technical Assistant in London under the late Mr. C. W. Neele, then Electrical Engineer. At the grouping Mr. Reed was transferred to Liverpool Street under Mr. F.

Downes, then Telegraph Superintendent, Southern Area, L.N.E.R., receiving the appointment he held at his retirement. Mr. Reed was an Associate Member of the Institution of Electrical Engineers, a Member of the Signal Section of the Association of American Railroads, and of the Institution of Railway Signal Engineers, joining the last named in 1918 and being a Member of Council at his retirement, when he made a generous gift of books to the library. The funeral took place at Harrow on December 4.

INSTITUTION OF LOCOMOTIVE ENGINEERS

At the general meeting of the institution held on November 24, the following were elected members and associate members:—

Members

Mr. J. E. Bagguley, Assistant Works Superintendent, L.M.S.R. locomotive works, Derby.

Mr. T. A. Prentice, Technical Assistant (Mechanical Engineering Department), London Passenger Transport Board.

Associate

Mr. S. H. Jones, Works Director, F. C. Hibberd & Co. Ltd.

Mr. H. Trevor Morgan, K.C., has been appointed Chairman of Traffic Commissioners, West Midland Traffic Area, in succession to Col. A. S. Redman, who resigns on December 31.

We regret to record the death, on December 7, of Mr. Christopher Hornby, formerly a Member of the Manchester City Council and at that time prominent on the Transport Committee. He was also a Director of the Manchester Ship Canal.

Sir Felix J. C. Pole, General Manager of the Great Western Railway from 1921-29, has been appointed Chairman of the Milford Docks Company. Sir Felix Pole's election to the board of the company was recorded in our issue of November 19.

Mr. Charles Latham, J.P., L.C.C., has been reappointed a part-time Member of the London Passenger Transport Board for three years as from the expiration of his present appointment on January 20, 1938.

The late Mr. A. W. Hamer, Assistant District Goods and Passenger Manager, Swansea, L.M.S.R., whose death on July 5 was recorded in our issue of July 23, left estate valued at £2,254 (£2,172 net).

INDIAN RAILWAY STAFF CHANGES

Mr. B. C. L. Bean, O.B.E., on return from leave has been posted as Officiating Deputy Chief Operating Superintendent (M.), N.W.R., as from October 13.

Mr. S. E. L. West has been appointed Divisional Superintendent, Ferozepur, N.W.R.

Lt.-Col. R. E. Gordon, M.C., R.E., on return from leave has been posted as Officiating Deputy Chief Engineer (N.), N.W.R.

Khan Bahadur Mazaffar Hussain has been appointed to officiate as Divisional Superintendent, Lahore, N.W.R.

Rai Bahadur D. N. Batra has been appointed to officiate as Deputy Chief Engineer, N.W.R., as from September 25.

Capt. R. B. Emerson, R.E., has been appointed to officiate as Deputy Controller of Stores, G.I.P.R., as from September 27.



Reproduction of an old print showing a trial run between Floridsdorf and Deutsch-Wagram, on the Kaiser Ferdinands Nordbahn, in November, 1837. (See "The Railway Gazette" of November 26)

"Father Christmas Comes to the Loco"

Southern Railway Western Division Locomotive Running Annual Dinner

It is difficult to imagine the spirit of Christmas associated with a Locomotive Department. This festive spirit was, however, very much in evidence at the fourteenth annual dinner given by the Western Division of the Southern Railway Locomotive Running Department, which was held on December 8 at the Crown Room, Holborn Restaurant, with its genial and popular Divisional Superintendent, Mr. E. S. Moore, in the chair. Among the various officers and guests were:—

Messrs. A. Cobb, Locomotive Running Supt.; R. M. T. Richards, Asst. Traffic Manager; H. E. O. Wheeler, Chief Operating Supt.; W. J. England, Asst. Operating Supt.; W. Pape, Personal Asst. to General Manager; J. A. Kay, Editor, *THE RAILWAY GAZETTE*; C. Grasmann, Public Relations and Advertising Officer; J. L. Moore, Ministry of Transport; J. E. Sharpe, London West Divl. Supt.; C. J. C. Latham, London Central Divl. Supt.; T. E. Chrimmes, Asst. Eastern Divl. Loco. Supt.; A. B. MacLeod, Personal Asst. to Loco. Running Supt.; A. J. Hollins, Staff Asst. to Loco. Running Supt.; W. T. Powell, Asst. Western Divl. Loco. Supt.; A. P. Shervington, Stephenson Clarke & Associated Companies; C. L. Simpson, Asst. to Locomotive Running Supt., Great Western Railway; A. W. H. Christison, Divl. Loco. Supt. Newton Abbot, Great Western Railway; W. R. Charlton, Supt. of the Line's Dept., Great Western Railway; Commander Graham, Chief Mechanical Engineer, Docks and Marine; Messrs. E. F. Bone, Asst. to Docks and Marine Manager; R. Hamilton Wicks, Vacuum Oil Co. Ltd.; V. G. Davies, Robt. Ingham, Clark & Co. Ltd.

Many other officials of the company, together with a good attendance of retired members of the staff, were present. The total number of those present was 145, a record attendance, which included visitors from every part of the Division, and extending as far west as Wadebridge and Barnstaple.

Following the dinner the first toast was "The King" and, presumably in recognition of the fact that this was a Coronation Year dinner, the National Anthem was rendered twice during the evening—before smoking, with reverence; and again before the final break up, with gusto—and at least one member of the party went home convinced that a Dual Monarchy now "reigned over us."

Mr. A. Cobb, Locomotive Running Superintendent, who was received with musical honours, replied to the toast, "The Southern Railway Directors and Officers," proposed by Mr. W. E. Neil, of Exeter. He paid a flattering tribute to Mr. E. S. Moore, his Assistant, Mr. W. T. Powell, and their staff, both at headquarters and at the depots for the manner in which the division had stood up to the heavy demands made on the Locomotive Running Department during the past year, including the Coronation, Naval Review, Ascot, Aldershot Tattoo, and also the changes incidental to colour-light installations. He expressed the hope that the demands would be even heavier during the forthcoming year, and his confidence that the Western Division would continue to

maintain its high standard. Mr. Cobb then referred to the various changes of officers that had occurred during the past year, and after reference to the sterling qualities of Sir Herbert Walker expressed the pleasure which was felt by all of those present at the prospect of serving under his popular successor, Mr. Gilbert Szlumper, as General Manager. Similarly, while they regretted the departure of Mr. R. E. L. Maunsell, they had in his successor, Mr. O. V. Bulleid, a Chief Mechanical Engineer who had come from a railway that still remained nearly a hundred per cent. steam, and one who was very eager to recognise the importance of close co-operation with the running side of the Locomotive Department. Mr. Cobb also referred to the appointment of Mr. R. M. T. Richards as Assistant Traffic Manager, and the pleasure felt by all present at the return of that very popular gentleman to his old love—the Operating Department.

Mr. R. M. T. Richards, in replying to the toast "The Visitors" given by the Chairman, in a characteristically humorous speech, observed that although most men were prepared to try anything once, they found in "Tony" Moore a man who, with regard to the Western Division annual dinner, kept on trying the same thing and getting better and better at it each year. He remarked that to keep up the pressure so well the Chairman must be running in very good condition with proper and adequate lubrication, boiler always full, and glands frequently renewed.

Mr. H. Keyzar, of Eastleigh, then proposed "The Chairman," who was also received with musical honours, this time more or less harmonised.

Mr. Moore, in responding, expressed his appreciation and thanks for the support of those present, referring particularly to Mr. C. Grasmann (Public Relations and Advertising Officer), who had rendered valuable assistance with regard to the various "stunts" that added so much to the amusement and enjoyment of the evening, and also to Mr. "Archie" England (Chief of Engine Working Section), who, with the assistance of Messrs. Cullingford and Dimmock as the Dinner Committee, had once more done all the "spade work" incidental to such occasions. Continuing, Mr. Moore then referred to those members of the Department who had passed away since the last dinner was held, including the late Mr. A. D. Jones, the former Locomotive Running Superintendent, and the company stood for a few moments in silence as a tribute to their memory.

The Chairman then proceeded to welcome the many guests present, but was not allowed to continue owing to a startling interruption in the form of a loud and prolonged blast on a coach

horn, which came from the balcony above, and was given by Mr. C. Grasmann to call the Chairman's attention to the fact that *Father Christmas* was without and was seeking admission. The Chairman expressing some doubt as to whether *Father Christmas* would hear a coach horn, himself gave three loud blasts on a siren when that worthy duly made his appearance, clad in the orthodox red robe and cowl, both liberally sprinkled with Epsom salts, but the spot light showed to the consternation of those present that this *Father Christmas* was minus the traditional white beard. It subsequently transpired that at the psychological moment, the white whiskers originally supplied with the outfit had completely disappeared, consequently, after a frantic but unsuccessful search, the company beheld a heated and angry *Father Christmas* with a military tooth brush moustache, and any of those present who still retained from their childhood days a belief in *Father Christmas*, must have been given food for very serious thought.

The guests having recovered from this shock there began the customary distribution of Christmas presents, and one of the most amusing of the many ingenious "stunts" put over on various guests was the spectacle of a bucolic gentleman who appeared garbed as a highwayman staggering under the weight of a dummy copy of the *History of the Southern Railway*, a tome measuring about four feet square with corresponding thickness and apparently too heavy for *Father Christmas* himself. This was presented appropriately to Mr. J. A. Kay, Editor of *THE RAILWAY GAZETTE*, with the hope that he would get home safely with it.

Two dummy speedometers graduated to 650 m.p.h. were then handed to Messrs. Simpson and Christison, representing the G.W.R., as a compliment to the enterprise of that company in fitting speedometers to its locomotives.

Messrs. Hamilton Wicks and "Bobbie" Davies received two shirts as an outward and visible sign of financial loss sustained by the Chairman with regard to an alleged greyhound which had been run with very doubtful success by those two gentlemen and which was probably a tortoise.

Mr. A. B. MacLeod (Personal Assistant to the Locomotive Running Superintendent) was the next to be presented with a gift, in the form of a model stores, complete with every commodity, including cash, and given in recognition of his impending promotion to the Stores Department. Mr. MacLeod retaliated by presenting the Chairman with a child's bead frame for counting, expressing the hope that the article would prove the best means of reckoning the engine failures recorded against his division.

The Chairman after he had recovered from his emotion remarked on the close resemblance of his present to a hare

and observed that it was probably the nearest he would ever get to possessing that celestial instrument. The gift of a spanner was then made to Mr. A. Shervington (of Stephenson Clarke & Co.), this item having been found in a consignment of coal that had been supplied to the Chairman by that gentleman's firm, and its use was recommended in connection with any tightness that Mr. Shervington might feel on his long journey back to Wembley.

To complete an evening which had more resemblance to a "Crazy Gang Show" than to the conventional Departmental Dinner, musical items were provided at intervals by an excellent concert party, with continuous gags to various members of the audience. The party dispersed after singing "Auld Lang Syne" with thoughts of "Here's to the Next Time."—W. T. P.

Staff and Labour Matters

Civil Engineers' Wages

At a meeting of the Civil Engineering Construction Conciliation Board held on Wednesday, December 8, agreement was reached for a national increase in the rates of wages of men employed in the civil engineering contracting industry. Under the agreement wages will be advanced by $\frac{1}{2}$ d. an hour from the beginning of January and by another $\frac{1}{2}$ d. an hour at the beginning of May, after which rates will remain stabilised until the end of February, 1939. The rates to which these increases will be applied are based upon those for navvies and labourers, who are at present paid 1s. 2 $\frac{1}{2}$ d. an hour in the County of London, and 1s. 2d. an hour in large centres, with lower rates for less important areas according to grade. The parties to the agreement are the Federation of Civil Engineering Contractors, the National Union of General and Municipal Workers, the Transport and General Workers' Union, and the National Union of Enginemmen, Firemen, & Mechanics.

Wage Claims—London Transport

A further joint meeting of the executives of the National Union of Railwaymen, the Associated Society of Locomotive Engineers & Firemen, and the Railway Clerks Association was held in London on Wednesday, December 8, to consider the claims for an increase of wages and improved conditions of service for the staff employed on the London Passenger Transport Board's railway undertakings. After the meeting it was announced that the executives of the three railway unions had decided to ask for a further meeting of the negotiating committee, which includes representatives of the board and the unions. The claims were lodged last March, and negotiations took place, but no conclusive result had been reached when it was decided to await the annual report of the board.

Christmas Arrangements

The heavy Christmas traffic expected on all main lines this year has been prepared for by extensive programmes of relief and additional trains. Nearly 1,000 long-distance passenger trains will be handled by the L.M.S.R. at Euston (600), and St. Pancras (400) between December 20 and 24. The same stations will in that period dispatch 57 special trains for parcels only; while inwards parcels traffic to Euston—arriving in 37 special trains—will be dealt with in a temporary depot at Maiden Lane, where the company will draft 174 of the 800 extra staff to be engaged in the London area alone. Sleeping car traffic will be provided for by 1,200 first class and 3,300 third class berths on trains leaving L.M.S.R. London termini for the North of England and Scotland.

The L.N.E.R. will run 1,500 additional trains for Christmas and New Year traffic. Long non-stop runs by some of these relief services were referred to in our issue of November 26. On Christmas Eve the 10.45 p.m. train from Marylebone for holders of night travel tickets to the North-East Coast will run in at least 17 parts. Passengers on these trains will be canvassed by travelling representatives of the company to ascertain the dates of their return, and so assist in providing adequate accommodation at the times required. The Eastern Counties will be served by nearly 200 special trains for Christmas passenger traffic alone, and stations in this area will dispatch 37 parcels trains to London. In Scotland there will be 630 extra trains (excluding those crossing the border) during the Christmas and New Year period. All Christmas football matches will be served by half-day excursions.

The Great Western Railway expects to deal with some 230,000 passengers at Paddington on December 23 and 24, when over 700 trains will arrive and depart. The loudspeaker installation will be valuable in controlling the large crowds, and some 100 additional porters will be employed to strengthen the platform staff. During the week before Christmas the company will run 475 additional passenger and relief parcels trains. In order to spread the outward rush on Christmas Eve, there will be extra trains to the West, the Midlands, and the North earlier and later than the regular daily services. Examples are the 9.0 a.m. to South Devon; an accelerated sleeping car service at 11.0 p.m. to Devon and Cornwall; and an express at 9.55 p.m. to Shrewsbury and the North. Terminal congestion will be relieved by special trains to South Wales from Slough, Ealing Broadway, and Southall, timed to enable the numerous Welsh people working in these districts—also in the vicinity of Reading and Didcot—to reach home on Christmas Eve. Cross-country services are also being supplemented.

The Southern Railway will run 113

extra trains on December 23 and 24, to the coast, the Continent, and the West. Of these, 24 will serve Bournemouth and Weymouth; 11 the West of England; 35 the Kent Coast; and 8 the Continent. Main-line electric services will be augmented. Five special late trains will be run on December 24 for the convenience of shop assistants, leaving Charing Cross at midnight and 12.5 a.m. for the Kent Coast; and Waterloo at 11.50 p.m., midnight, and 12.3 a.m. for Portsmouth, Bournemouth, and the West of England. Further reference to Southern Railway Christmas arrangements is made in an editorial note on page 1155.

Questions in Parliament

Castleary Railway Accident

Mr. T. Cassells (Dumbartonshire—Lab.) on December 13 asked the Minister of Transport if he had any statement to make in connection with the railway accident which occurred in the late afternoon of Friday last at Castleary, Dumbartonshire, when 35 persons were killed and 67 injured, and further to state if it was intended that a public Government inquiry or an inquiry by the Procurator Fiscal for the County of Dumbarton be instituted, and, if so, when; and also to state if the coaches involved were of wooden construction; and also to advise as to the number of passengers travelling in the trains involved who were holders of cheap day tickets.

Dr. Leslie Burgin (Minister of Transport): The London & North Eastern Railway Company informs me that at about 4.40 p.m. on Friday last the 4.3 p.m. express passenger train from Edinburgh to Glasgow ran into the rear of the 2 p.m. express passenger train from Dundee to Glasgow, whilst the latter train was stationary just beyond Castleary, Dumbartonshire. It is with the deepest regret that I have to state that, so far as is at present known, 34 persons were killed and one has since died; 24 were detained in hospital and 68 have been reported as suffering from minor injuries or shock. I have already appointed the Chief Inspecting Officer of Railways to hold an inquiry. He visited the scene of the accident on Saturday, and will open his inquiry at Edinburgh on Thursday next, December 16. I am not yet in a position to give information as to the construction of the coaches or as to the number of passengers holding cheap day tickets. The House will wish me to take this opportunity of expressing the deep sympathy which we all must feel with those affected by the accident.

Mr. Cassells: If it is ascertained that the coaches were of wooden construction, and in the light of the fact that steel coaches have a distinct advantage over wooden coaches, will the Minister state what the policy will be as far as the future is concerned?

The Speaker intervened and called the next question.

NOTES AND NEWS

Opening of L.M.S.R. New Halt.—

The L.M.S.R. announces that Girtford halt, between Blunham and Sandy stations, on the Bletchley to Cambridge line, will be opened on January 1, 1938.

Workmen Killed by Train in Pomerania.—On Saturday, December 4, eleven men working on the permanent way near Zarnefan, Pomerania, Germany, were run down and killed by a train. Seven others received injuries.

Baltic Snowstorm.—During a heavy snowstorm on the Baltic seaboard last week, the Sassnitz-Trelleborg train-ferry *Preussen* struck a rock off the island of Rügen. Salvage ships from Hamburg assisted her to port. Railway traffic in north-west Germany was disorganised by the storm.

Jersey Airways Late Christmas Eve Service.—Among the special arrangements made by Jersey Airways Limited for Christmas travel is a service leaving Jersey Airport at 4.30 p.m. on Christmas Eve for Southampton (arr. 5.30 p.m.). This will be the company's first scheduled "after dark" passenger service in winter, and is being introduced for the convenience of passengers unable to catch the morning plane direct to London.

Last Section of Warsaw Electrification Opened.—The 25-mile line of the Polish State Railways between Warsaw and Minsk Mazowiecki electrified by the English Electric Company and Metropolitan-Vickers, was opened by the Minister of Communications last Tuesday. This is the final section of the 140-mile Warsaw electrification under the contract awarded in 1933. Further electrification is contemplated. The contractors were represented by

Mr. G. H. Nelson (Chairman and Managing Director of English Electric), Sir G. F. Talbot, and Messrs. C. F. Fairburn, H. Andrews, C. Corbridge, and C. S. Silson.

L.N.E.R. Secretary's Departmental Dinner.—In our report of this function on page 1033 last week, the number of members of the department present was stated, through a typographical error, as 900, whereas it should have been about 90.

Electric Locomotives for L.N.E.R. Sheffield - Manchester Line.—Our Contracts and Tenders section this week records the placing of a contract by the L.N.E.R. with the Metropolitan-Vickers Electrical Co. Ltd. for the supply of 70 electrical equipments required for 70 mixed traffic locomotives to be used on the forthcoming Manchester-Sheffield electrification. These are to be four-axle double-bogie locomotives taking d.c. at 1,500 V. from an overhead conductor line system, and will be used for all classes of traffic except express passenger trains. A small number of electric locomotives of express type will be required for the latter purpose.

Increase in Argentine Railway Rates Foreshadowed.—A Reuters message from Buenos Aires, dated December 10, states it is authoritatively learned that the Government is contemplating an increase in Argentine railway rates, and that a decree authorising such an increase will be signed before the expiry of President Justo's term of office in February. This information follows a favourable report by the General Direction of Railways admitting that the companies' situation has not improved despite increased traffic, owing to enhanced expenditure. It is under-

stood that the decree is in preparation, but its contents are not revealed. The belief, however, is that it will authorise a partial increase in rates for certain companies.

The Difficulties of American Rail-

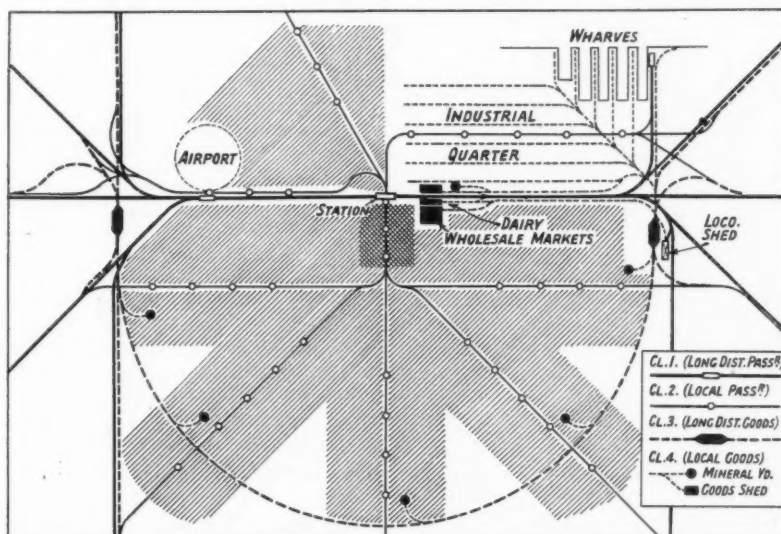
ways.—A Reuters message from Washington states that 96 railway companies in the United States are at present in the hands of receivers or trustees. These railways work a total of 71,386 miles of line, or 28 per cent. of the entire mileage in the country. Owing to rising costs of materials and supplies, fuel, taxes, and wages, the total cost of running the railways in the U.S.A. is now about £132,000,000 a year more than in 1933.

The Scottish Railway Collision.—

The worst railway accident in Great Britain since that at Grtna on May 22, 1915, occurred at Castlecary on the Edinburgh-Glasgow main line of the L.N.E.R. at about 4.40 p.m., on Friday, December 10. The circumstances are given in the Minister of Transport's reply to a question in Parliament set out opposite. The Pacific type locomotive No. 2744, *Grand Parade*, hauling the Edinburgh-Glasgow express which ran into the rear of the standing Dundee train was overturned and buried against the side of the cutting, the driver and fireman having remarkable escapes. The first coach of the train mounted the locomotive and others were more or less seriously damaged. Most of the casualties were in the last two coaches of the Dundee train. Darkness and bad weather made rescue work difficult, and bonfires of debris were lighted to aid the rescuers. Numerous messages of sympathy have been received, including one from the French Minister of Public Works to the British Minister of Transport. The L.N.E.R. has expressed its appreciation of the assistance rendered by those who took part in the rescue work. Mr. John Binnie, the Procurator Fiscal for Stirlingshire, has called for a full report into the cause of the accident. Normal working on the main line was resumed 56 hours after the collision. Lt.-Col. A. H. L. Mount, Chief Inspecting Officer for Railways, Ministry of Transport, opened the official enquiry at Edinburgh yesterday (Thursday).

Northern Ireland Road Transport

Board.—The Northern Ireland House of Commons passed on December 2 the Road and Railway Transport Bill which proposes to extend the powers of the Northern Ireland Road Transport Board as to the application of money borrowed under Section 20 of the Road and Railway Transport Act (Northern Ireland), 1935. It makes good the omission in the 1935 Act of the usual provision in legislation of the kind dealing with interest on capital during the development period. It enables the board to pay interest on its stock out of capital within a period of five years from the date of the establishment of the board, and it restricts the exercise of these powers to such extent as may be approved



Diagrammatic representation of railway arrangements in a city of the future, as outlined by Mr. Roy V. Hughes in a recent paper to the Permanent Way Institution. (See editorial note on page 1154)

by the Minister of Finance and the Minister of Home Affairs. The Bill has now to be dealt with by the Senate.

Important London Address Changes.—On December 20, 1937, the address of the London registration offices of the Buenos Ayres & Pacific Railway Co. Ltd., and also of the Costa Rica Railway Co. Ltd., will be No. 117, Old Broad Street, E.C.4, which, after December 24, will also house the London registration offices of the Algoma Central and Hudson Bay Railway Company, Algoma Central Terminals Limited, and Algoma Consolidated Corporation Limited. The telephone number of the Algoma group will be London Wall 1750; those of the other companies will be unchanged.

Funeral Service for Mr. A. J. Brickwell.—The funeral service for the late Mr. A. J. Brickwell, formerly Estate and Rating Surveyor, Southern Area, L.N.E.R. (whose death on December 10 is recorded on page 1183), was held at Barnet parish church on December 14, and was followed by interment at Totteridge churchyard. In addition to family mourners and relatives, the

following representatives of the London & North Eastern and other railways were present:—

L.N.E.R.: Mr. William Whitelaw, Sir Ralph Wedgwood, Messrs. C. H. Newton, Mr. H. W. J. Powell, Mr. R. J. M. Inglis, Mr. C. J. Selway, Mr. V. M. Barrington-Ward, Mr. J. E. Ryan, Mr. G. Sowerby, Mr. P. J. Dowsett. *Chief Legal Adviser's Department:* Mr. W. H. Hanscombe (also representing Mr. I. B. Pritchard), Messrs. W. R. Mole, E. Coleby, C. Nixon. *Surveyor's Department:* Messrs. C. B. Tidmarsh, A. R. A. Bates, A. P. Howard, S. S. Jenkinson, H. J. Caines, H. B. Dean, E. G. Pollington, J. E. Jackson, C. E. Collyer, M. S. Prescott, J. Johnson, F. Allwright, S. W. Tiffin, L. Sendall, W. Blanchard. *Secretary's Department:* Capt. Thomas. *Passenger Manager's Department:* Mr. A. Oddy. *Retired Members:* Messrs. S. A. Parnwell, W. M. Teasdale, J. Oldham, E. A. Clear, Murgatroyd, R. H. Walker.

Great Western Railway: Mr. F. W. Showers, Surveyor.

Southern Railway: Mr. J. G. Symes (also representing Mr. A. Endicott, Estate Agent), Mr. Davis (representing Mr. S. E. Hitchcock, Rating Agent), Mr. H. E. Judd (late Rating Agent).

London Midland & Scottish Railway: Mr. F. Smith, Rating Agent.

London Passenger Transport Board: Mr. T. C. West (also representing Mr. F. C. Buller, Estate and Rating Agent).

Numerous representatives of the Barnet Council (of which Mr. Brickwell was a member) and of local hospitals were also present.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 49th Week			Totals to Date		
	1937	1936	Inc. or Dec.	1937	1936	Inc. or Dec.
	£	£	£	£	£	£
L.M.S.R. (6,867 mls.)						
Passenger-train traffic...	435,000	420,000	+ 15,000	25,289,000	24,319,000	+ 970,000
Merchandise, &c. ...	528,000	508,000	+ 20,000	24,442,000	23,662,000	+ 780,000
Coal and coke ...	335,000	301,000	+ 34,000	12,689,000	11,904,000	+ 785,000
Goods-train traffic ...	863,000	809,000	+ 54,000	37,141,000	35,566,000	+ 1,575,000
Total receipts ...	1,298,000	1,229,000	+ 69,000	62,430,000	59,885,000	+ 2,545,000
L.N.E.R. (6,315 mls.)						
Passenger-train traffic...	297,000	287,000	+ 10,000	16,598,000	15,887,000	+ 711,000
Merchandise, &c. ...	363,000	356,000	+ 7,000	16,848,000	16,237,000	+ 611,000
Coal and coke ...	295,000	272,000	+ 23,000	12,305,000	11,486,000	+ 819,000
Goods-train traffic ...	658,000	628,000	+ 30,000	29,153,000	27,723,000	+ 1,430,000
Total receipts ...	955,000	915,000	+ 40,000	45,751,000	43,610,000	+ 2,141,000
G.W.R. (3,739½ mls.)						
Passenger-train traffic...	175,000	172,000	+ 3,000	10,605,000	10,334,000	+ 271,000
Merchandise, &c. ...	215,000	206,000	+ 9,000	9,925,000	9,507,000	+ 418,000
Coal and coke ...	129,000	121,000	+ 8,000	5,537,000	4,976,000	+ 561,000
Goods-train traffic ...	344,000	327,000	+ 17,000	15,462,000	14,483,000	+ 979,000
Total receipts ...	519,000	499,000	+ 20,000	26,067,000	24,817,000	+ 1,250,000
S.R. (2,147 mls.)						
Passenger-train traffic...	258,000	252,000	+ 6,000	15,808,000	15,069,000	+ 739,000
Merchandise, &c. ...	62,000	65,500	- 3,500	3,082,500	3,120,500	- 38,000
Coal and coke ...	37,000	36,500	+ 500	1,489,500	1,510,500	- 21,000
Goods-train traffic ...	99,000	102,000	- 3,000	4,572,000	4,631,000	- 59,000
Total receipts ...	357,000	354,000	+ 3,000	20,380,000	19,700,000	+ 680,000
Liverpool Overhead ...	1,344	1,196	+ 148	63,833	58,584	+ 5,249
(6½ mls.)						
Mersey (4½ mls.) ...	4,534	4,710	- 176	206,341	201,862	+ 4,479
*London Passenger Transport Board ...	570,800	564,900	+ 5,900	13,472,200	13,466,900	+ 5,300
IRELAND						
*Belfast & C.D. pass. (80 mls.)	1,591	1,525	+ 66	124,578	125,626	- 1,048
" " goods	476	427	+ 49	23,723	26,610	- 2,887
" " total	2,067	1,952	+ 115	148,301	152,236	- 3,935
Great Northern (543 mls.) pass.	8,250	7,900	+ 350	540,000	525,050	+ 14,950
" " goods	8,500	9,150	- 650	462,750	480,500	- 17,750
" " total	16,750	17,050	- 300	1,002,750	1,005,550	- 2,800
Great Southern (2,076 mls.) pass.	29,443	30,458	- 1,015	1,780,224	1,760,468	+ 19,756
" " goods	53,448	56,465	- 3,017	2,130,378	2,172,512	- 42,134
" " total	82,891	86,923	- 4,032	3,910,602	3,932,980	- 22,378

* 24th week (before pooling)

† 50th week

British and Irish Railway Stocks and Shares

Stocks	Highest 1936	Lowest 1936	Prices	
			Dec. 15, 1937	Rise Fall
G.W.R.				
Cons. Ord.	64½	45½	62½	+½
5% Con. Prefce.	126½	116½	117½	—
5% Red. Pref. (1950) ..	113	108½	110½	—
4% Deb.	119½	110½	108*	-½
4½% Deb.	121	114	109½*	-½
4½% Deb.	129	121	116½*	-½
5% Deb.	141	134	126½*	-½
2½% Deb.	79½	74	68½*	-½
5% Rt. Charge	136½	130	125½*	-½
5% Cons. Guar.	135½	127½	125½	—
L.M.S.R.				
Ord.	35½	17	29½	—
4% Prefce. (1923)	83	52½	70½	—
4% Prefce.	92½	81	82	+½
5% Red. Pref. (1955) ..	109½	103½	104*	-½
4% Deb.	111½	105½	104*	-½
5% Red. Deb. (1952) ..	119½	115½	113½	—
4% Guar.	106½	101½	101	+½
L.N.E.R.				
5% Pref. Ord.	14	9	8	—
Def. Ord.	7½	4½	4½	-½
4% First Prefce.	79½	55½	67½	—
4% Second Prefce.	31½	18½	26	—
5% Red. Pref. (1955) ..	100½	77½	97½	—
4% First Guar.	104½	98½	95½	+½
4% Second Guar.	99	90	89	+½
3% Deb.	85½	79	78½*	-½
4% Deb.	109½	104½	102½*	-½
5% Red. Deb. (1947) ..	116½	110½	110½	—
4½% Sinking Fund Red. Deb.	111½	107½	107*	½
SOUTHERN				
Pref. Ord.	98½	82½	87	—
Def. Ord.	27½	20½	19	—
5% Pref.	120½	118½	114½	—
5% Red. Pref. (1964) ..	119½	115½	113½	—
5% Guar. Prefce.	136	129½	125	—
5% Red. Guar. Pref. (1957) ..	120	115½	115	—
4% Deb.	117½	109½	106½	—
5% Deb.	140	134	125½	—
4% Red. Deb. 1962-67 ..	116½	110	105½	—
BELFAST & C.D.				
Ord.	9	4½	4½	—
FORTH BRIDGE				
4% Deb.	107	105	100½*	-½
4% Guar.	107½	104	100½*	-½
G. NORTHERN (IRELAND)				
Ord.	19½	9½	5	—
G. SOUTHERN (IRELAND)				
Ord.	63	41	27	—
Prefce.	65	46	35	—
Guar.	97½	81	70½	—
Deb.	99½	83½	86	—
L.P.T.B.				
4½% "A"	127½	121	117½	—
5% "A"	138½	133½	127½	+½
4½% "T.F.A."	111½	108½	106	—
5% "B"	131½	123½	120½	+½
"C"	112½	93	80	-½
MERSEY				
Ord.	40½	23	23½	-½
4% Perp. Deb.	103	98	97	—
3% Perp. Deb.	78	74½	75½	—
3% Perp. Prefce.	68½	63½	66½	—

* ex dividend

CONTRACTS AND TENDERS

L.N.E.R. Rolling Stock Orders

The L.N.E.R. has placed contracts for the supply of 234 third class saloon and corridor vestibuled coaches, 155 20-ton coal wagons, 100 40-ton timber wagons, and 900 containers, divided as follow:—

Metropolitan-Cammell Carriage & Wagon Co. Ltd.; 104 open vestibuled third class coaches and 550 containers.

Birmingham Railway Carriage & Wagon Co. Ltd.; 106 third class corridor coaches.

Cravens Railway Carriage & Wagon Co. Ltd.; 24 open vestibuled third class coaches and 350 containers.

Hurst, Nelson & Co. Ltd.; 155 20-ton coal wagons.

R. Y. Pickering & Co. Ltd.; 100 40-ton timber wagons.

Manchester-Sheffield-Wath Electrification, L.N.E.R.

The L.N.E.R. announces that, in connection with the Manchester-Sheffield-Wath electrification scheme, a contract has been placed with the Metropolitan-Vickers Electrical Co. Ltd. for the design, manufacture, and erection of 70 complete electrical equipments required for 70 mixed traffic electric locomotives, and suitable for the overhead line conductor system, using direct current at 1,500 volts, which is the higher voltage standard system authorised by the Ministry of Transport. These mixed traffic locomotives will be of the four-axle double-bogie type, having estimated weights of 80 tons each, and developing approximately 1,850 h.p. The mechanical portion of the locomotives, comprising the underframe, superstructure, and motor bogies, will be built by the railway company. The line between Manchester, Sheffield, and Wath has heavy gradients, in one case as steep as 1 in 40 for rather more than 2 miles, and the traffic on this section is particularly dense, varying in character from express passenger trains of 250 tons to heavy mineral trains of 1,100 tons in weight. It is intended that these mixed traffic locomotives shall be used for all classes of traffic, except express passenger, for which a small number of electric locomotives of express type will be required.

The South Indian Railway Administration has placed the following orders to the inspection of Messrs. Robert White & Partners:—

Banting & Tresilian Limited; 4,100 solid drawn steel boiler tubes.

F. E. Rowland & Co.; one single-wheel tool grinder.

Kitchen & Wade Limited; one radial drilling machine.

Bayliss, Jones & Bayliss Limited has received an order for 135,000 steel fishbolts, nuts, and washers for 85-lb. rails, from the Central Argentine Railway.

Leyland Motors Limited has received an order from the Southdown Motor Services Limited for five oil-engined Tiger passenger vehicles.

The Associated Equipment Co. Ltd. has received an order from the Northern Ireland Road Transport Board for one petrol-driven Regal passenger vehicle.

Owen & Dyson Limited has received an order for 200 pairs of solid-type wheels and axles for bogie convertible double-decked cattle wagons, from the Central Argentine Railway.

Diesel Railcar Order

Walker Brothers (Wigan) Limited has received an order from the Peruvian Corporation for one diesel railcar.

Heatly & Gresham Limited has received orders from the North Western Railway of India for 25 steel firebox flanged back plates and 40 steel firebox flanged tube plates.

Boilers for India

The Bengal-Nagpur Railway Administration has placed orders for a total of eight boilers and a quantity of locomotive spares divided as follows:—

W. G. Bagnall Limited; eight superheated boilers for "B" Class locomotives.

Robert Stephenson & Hawthorns Limited; eight superheated boilers for "C" Class locomotives.

Vulcan Foundry Co. Ltd.; quantity of locomotive spares.

G.W.R. Contracts

The directors of the Great Western Railway Company have authorised the placing of the following contracts:—

Scammell Lorries Limited, One six-ton A.L. tractor fitted with Perkins diesel oil engine and one six to ten-ton Hybrid carrier.

Wm. Wadsworth & Sons Ltd., Supply and erection of one electric 30-cwt. passenger lift in the parcels office building, Paddington.

Creed & Co. Ltd., Supply and installation of start-stop teleprinter telegraph system at Paddington, Bristol, Exeter and Plymouth.

Holliday & Greenwood Limited, Construction of new station buildings at Leamington.

The Parker Construction Co. Ltd., Construction of new transit shed in Paddington new mileage yard.

John Thompson (Wolverhampton) Limited, One Lancashire boiler for heating No. 24 Shop, Swindon Carriage Works.

Vickers-Armstrongs Limited, Supply and erection of dock gates for upper end of Junction Lock, Cardiff Docks.

East Ferry Road Engineering Works Co. Ltd., Supply and erection of four three-ton movable hydraulic cranes for King's and Schroeter's Wharves, Cardiff Docks.

B. & S. Massey Limited has received an order for one 10-cwt. pneumatic power hammer from the Central Uruguay Railway.

The Crown Agents for the Colonies have recently placed the following orders:—

Power Samas Accounting Machines Limited; accounting machines.

Turners Asbestos Cement Company; asbestos cement and pressure piping, and cast-iron pipe specials.

G. D. Peters & Co. Ltd.; blinds for caboose coaches.

Hurst, Nelson & Co. Ltd.; bogie frames for caboose coaches.

P. & W. MacLellan Limited; boiler steel, mild steel plates, bars, angles, and round steel joists.

C. Richards & Sons Ltd.; bolts and nuts.

T. Bolton & Sons Ltd.; bronze wire and copper rod.

Stanton Ironworks Co. Ltd.; cast-iron water pipes.

Guest, Keen & Nettlefolds Limited; clip bolts, dogspikes, and rail clips.

J. Booth & Co. (1915) Ltd.; copper wire.

E. & E. Kaye Limited; copper wire.

Whitcross Co. Ltd.; copper wire.

Whitelegg & Rogers Limited has received orders for 80 Ajax steam-operated firedoors for application to "19 D" Class 4-8-2 type locomotives, now under construction by Fried. Krupp A.G. for the South African Railways & Harbours Administration; and 14 Ajax steam-operated firedoors for new Beyer-Garratt locomotives now being built by Beyer Peacock & Co. Ltd. for the Rhodesia Railways.

The Chief Controller of Stores, Indian Stores Department (Engineering Section), New Delhi, invites tenders receivable by January 3 for the supply of 4,450 brake beams and 10,000 bushes, required for the North Western Railway.

Tenders are invited by the Government of India, Railway Department (Railway Board), for construction in India and supply of 16 metre-gauge goods wagons divided as follows: two "MOM"-type open wagons, 11 "MBVG"-type goods brake vans, one "MBW"-type bogie well wagons, and two "MBR"-type bogie rail wagons.

The Chief Controller of Stores, Indian Stores Department (Engineering Section), New Delhi, invites tenders receivable by January 4, for the supply of 303,360 mild steel split cotter for plate sleepers, required for the G.I.P. Railway.

H.M. Trade Commissioner at Johannesburg reports that the South African Railways & Harbours Administration is calling for tenders (Tender No. 1565) for the supply and delivery of approximately 361 tons of steel bridgework, together with bolts, nuts, and rivets. Tenders endorsed "Tender No. 1565 for Bridgework" should reach the Secretary to the Tender Board, South African Railways & Harbours Headquarters Office, Johannesburg, by February 14, 1938.

Forthcoming Events

Dec. 17 (Fri.).—Institute of Transport (East Midlands), at Guildhall, Nottingham, 7 p.m. Representation of a Hearing before a Traffic Commissioner's Court.

Institute of Transport (Manchester-Liverpool), at Exchange Station Hotel, Liverpool, 6.30 p.m. "Some Passenger Transport Problems with Special Reference to the movement of heavy traffic," by Dr. K. G. Fenlon.

Institute of Welding (South Wales), at Technical College, Swansea, 7.30 p.m. "Structural Welding," by Mr. S. Reisser.

Dec. 18 (Sat.).—L.N.E.R. Musical Society, at Queens Hall, Langham Place, W.1, 8 p.m. Carol Concert.

Dec. 21 (Tues.).—Institute of Transport (Leeds Graduate), at City Transport Department, 7 p.m. Discussion of Transport Problems. Institute of Transport (London), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. "Roads at Home and Abroad," by Mr. R. Birch.

Institute of Welding (London), at Inst. of Mechanical Engineers, Storey's Gate, S.W.1, 6.30 p.m. "American Arc Welding Practice and its Influence on Quality and Cost," by Mr. J. Paterson.

Permanent Way Institution (Scottish), at Royal Technical College, George Street, Glasgow, 7.30 p.m. "Resurfacing of Worn Crossings by Oxy-Acetylene Welding," by Mr. R. Dove.

LEGAL AND OFFICIAL NOTICES

In the Court of the Railway Rates Tribunal.

Road and Rail Traffic Act, 1933.

Agreed Charges.

NOTICE IS HEREBY GIVEN that Applications for the approval of Agreed Charges under the provisions of Section 37 of the Road and Rail Traffic Act, 1933, short par-

ticulars of which are set out in the Schedule hereto, have been lodged with the Railway Rates Tribunal.

The Procedure to be followed in regard to the inspection of the said Applications and the filing of Notices of Objections is that published in the *London Gazette* of 28th July, 1936.

Printed copies of the Procedure can be obtained from the Railway Rates Tribunal, Bush House, Aldwych, London, W.C.2.

Notices of Objection to any of the said Appli-

cations must be filed on or before the 4th January, 1938.

A copy of each Application can be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, Fielden House, Great College Street, Westminster, London, S.W.1, price 1s. post free.

T. J. D. ATKINSON,

Registrar.

8th December, 1937.

Number of Application	Name of Trader and General Description of Traffic	Number of Application	Name of Trader and General Description of Traffic
1937— No. 640	THOMAS RATCLIFFE & CO. LTD., Albert Mills, Mytholmroyd ; Blankets, etc.	1937— No. 680	ARTHUR SHAW & CO. LTD., Willenhall, Staffs ; Hardware, etc.
1937— No. 641	H. WORKSWICK LIMITED, Arcadia Works, Lytham, Lytham St. Annes ; Slippers, etc.	1937— No. 681	WEBER LIMITED, 29, Cowercross Street, London, E.C.1 ; Bacon and Hams, Preserves, Provisions, etc.
1937— No. 642	REED & SMITH LIMITED, Silverton Mills, Bradninch, Devon ; Paper. <i>Applicable also to traffic consigned by two Associated or Subsidiary Companies.</i>	1937— No. 682	WIGGINS, TEAPE & ALEX. PIRIE (SALES) LIMITED, 46/58, Mansell Street, Aldgate, London, E.1 ; Paper ex Dover.
1937— No. 643	HENRY MELLOR & SON, Brook's Yard, Market Street, Huddersfield ; Woollen and Worsted Cloth.	1937— No. 683	THE FREDER CREPE PAPER MILLS LIMITED, Lea Bridge Road, London, E.10 ; Paper, etc.
1937— No. 644	J. A. & S. PORTALS LIMITED, Stowford Mills, Ivybridge ; Paper.	1937— No. 684	GIBSON BROTHERS (LIVERPOOL) LIMITED, Kempston Street, Liverpool, 3 ; "Gibro" Table Delicacies.
1937— No. 645	THE SHIELDS ICE & COLD STORAGE CO. LTD., North Shields ; Preserves, Provisions, etc.	1937— No. 685	HARTLEY, SONS & CO. (HEBDEN BRIDGE) LTD., Linden Works, Hebden Bridge ; Clothing.
1937— No. 646	TATTS POTATO CRISPS LIMITED, Anghton, Ormskirk ; Potato Crisps.	1937— No. 686	LENNARDS LIMITED, Queen's Road, Bristol, 8 ; Boots and Shoes, etc.
1937— No. 647	WIGGINS, TEAPE & ALEX. PIRIE (SALES) LIMITED, Aldgate House, 46/58, Mansell Street, London, E.1 ; Paper, etc., ex London. <i>Applicable also to traffic consigned by two Associated or Subsidiary Companies.</i>	1937— No. 687	RYLANDS & SONS LTD., High Street, Manchester, 4 ; Drapery and Textiles.
1937— No. 648	WALTER GREGORY & CO. LTD., Wellington, Somerset ; Cattle Medicines, etc.	1937— No. 688	THORNER BROS. LTD., Square Works, Mytholmroyd, Yorks ; Poultry, Chicken Brooders and Fittings.
1937— No. 649	DUSMO CO. LTD., Angel Road, Edmonton, London, N.18 ; Sanitary	1937— No. 689	EXCEL CO. LTD., 50 & 52, St. John Street, West Smithfield, London, E.C.1 ; Cooked Meats, etc.
1937— No. 650	THE EMU WINE CO. LTD., Emu House, St. Leonards Street, Bromley-by-Bow, London, E.3 ; Wines, etc.	1937— No. 690	THE PILE FABRIC MANUFACTURING CO. (BRADFORD) LTD., Industry Works, Bradford, Yorks ; Furnishing Fabrics.
1937— No. 651	CALOR GAS (SCOTLAND) LIMITED, 1A, Blythswood Square, Glasgow, C.2 ; Butane Gas.	1937— No. 691	THE SHIELDS ICE & COLD STORAGE CO. LTD., North Shields ; Preserved Food, etc.
1937— No. 652	THE WALL PAPER MANUFACTURERS LIMITED, 125, High Holborn, London, W.C.1 ; Paint and Wallpaper. <i>Applicable also to traffic consigned by fifteen Associated or Subsidiary Companies.</i>	1937— No. 692	C. F. TAYLOR & CO. LTD., Shipley ; Knitting Wool.
1937— No. 653	M. SAPER LIMITED, Argall Avenue, Lea Bridge Factory Estate, London, E.10 ; Confectionery and Sugar.	1937— No. 693	W. A. TURNER, "The Garden Factory," Stowmarket ; Preserved Meat, etc.
1937— No. 655	BRITISH HOME STORES LIMITED, Abbey House, 221, 223, Baker Street, London, N.W.1 ; Earthenware and Glassware.	1937— No. 694	THE VICTORIA CREAMERY CO. LTD., Airdrie ; Bakers' Filling Cream, etc.
1937— No. 656	DUNN'S FOOTWEAR LIMITED, Willoughby Lane, Tottenham, N.17 ; Boots, Shoes, etc.	1937— No. 695	ROSE, MORRIS & CO. LTD., 57, City Road, London, E.C.1 ; Musical Instruments, etc.
1937— No. 657	GORDON & PHILLIPS LIMITED, Russell House, Russell Street, Nottingham ; Cardboard, etc.	1937— No. 696	THE DISTRIBUTORS AND TRANSPORTERS LIMITED (MESSRS. UNILEVER'S DISTRIBUTING ORGANISATION), Unilever House, Blackfriars, London, E.C.4 ; Margarine, Lard, etc. <i>Applicable to traffic consigned by two Associated or Subsidiary Companies.</i>
1937— No. 658	MORNING DEW PRODUCTS LIMITED, Gaul Street, Bulwell, Nottingham ; Fruit and Vegetables, in tins, Peas, dried.	1937— No. 697	SPEKRYN & CO., Moorson Street Works, Birmingham, 6 ; Hardware, etc. <i>Applicable also to traffic consigned by three Associated or Subsidiary Companies.</i>
1937— No. 659	J. & H. PHILIPS & CO. LTD., Church Street, Manchester ; Drapery and Textiles.	1937— No. 698	MONSANTO CHEMICALS LIMITED, Victoria Station House, Victoria Street, London, S.W.1 ; Disinfecting Fluid.
1937— No. 660	THE SOUTHERN OIL CO. LTD., Westinghouse Road, Trafford Park, Manchester, 17 ; Lard and Lard Substitutes.	1937— No. 699	MONSANTO CHEMICALS LIMITED, Victoria Station House, Victoria Street, London, S.W.1 ; Empties returned to the Trader.
1937— No. 661	THOMSON & CHARNOCK LIMITED, 16 to 20, Stanley Road, Liverpool, 5 ; Poultry Food, etc.	1937— No. 700	THE FORE STREET WAREHOUSE CO. LTD., 104, Fore Street, London, E.C.2 ; Drapery, etc.
1937— No. 662	A. H. TUCKER & CO. LTD., Wallbridge Mills, Frome ; Cloth, Wool, etc.	1937— No. 701	RICHARD & CO. LTD., 10-18, Goswell Road, London, E.C.1 ; Clocks, etc.
1937— No. 663	BENNETT BROS. (HOSIERY MANUFERS. & DYERS) LTD., Southfield Road, Hincley ; Hosiery.	1937— No. 702	FAUDELS LIMITED, 40, Newgate Street, London, E.C.1 ; Drapery, Fancy Goods, etc.
1937— No. 664	BRITISH PATENT PERFORATED PAPER CO. LTD., Hackney Wick, London, E.9 ; Toilet Paper, Paper Towels, etc.	1937— No. 703	ALBERT E. REED & CO. LTD., Maidstone, Kent ; Waste Paper.
1937— No. 665	THE CALOR-GAS (DISTRIBUTING) CO. LTD., Belgrave House, Belgrave Street, Euston Road, London, W.C.1 ; Butane Gas.	1937— No. 704	THE DUCHESS OF DEVONSHIRE DAIRY CO. LTD., Tiverton, Devon ; Preserves and Provisions.
1937— No. 666	CAIPEALS LIMITED, Trading Estate, Slough ; Cardboard Containers, etc.	1937— No. 705	THE FORE STREET WAREHOUSE CO. LTD., 104, Fore Street, London, E.C.2 ; Drapery, etc.
1937— No. 667	FAIRE BROS. & CO. LTD., Rutland Street, Leicester ; Drapery, etc.	1937— No. 706	R. SUTCLIFFE & CO., Melbourne Works, Hebden Bridge ; Clothing.
1937— No. 668	HARDEN BROS. & LINDSAY LIMITED, 30-34, Mining Lane, London, E.C.3 ; Tea, Coffee, Cocoa, etc.	1937— No. 707	THE WESSEX GLOVE CO. LTD., Yeovil, Somerset ; Gloves.
1937— No. 669	ARTHUR HARRISON & CO. LTD., Globe Mills, Victoria Road, Leeds, 11 ; Cloth.	1937— No. 708	A. P. BISHOP, Haverfordwest ; Rabbits (dead).
1937— No. 670	H. P. SAUCE LIMITED, Aston Cross, Birmingham, 6 ; Pickles, Sauce, etc.	1937— No. 709	GEORGE BRETTE & CO. LTD., 119, Wood Street, London, E.C.2 ; Gloves, Hosiery, etc.
1937— No. 671	THE IMPERIAL TOBACCO COMPANY (OF GREAT BRITAIN AND IRELAND) LTD., East Street, Bedford, Bristol ; Manufactured Tobacco, etc.	1937— No. 710	THE CELLULAR CLOTHING CO. LTD., 14, Moor Lane, London, E.C.2 ; Shirts and Underwear.
1937— No. 672	JEFFREYS, MILLER & CO. LTD., Leyland Mills, Wigan ; Extract of Malt, etc. <i>Applicable also to traffic consigned by two Associated or Subsidiary Companies.</i>	1937— No. 711	JOHNSON BROTHERS (DYERS) LIMITED, Bootle Dye Works, Liverpool ; Dyed and Cleaned Goods, etc.
1937— No. 673	KAY (SPORTS & GAMES) LIMITED, Carlisle Road, The Hyde, London, N.W.9 ; Toys, etc.	1937— No. 712	I. & R. MORLEY LIMITED, 18, Wood Street, London, E.C.2 ; Gloves, Hosiery, etc.
1937— No. 674	J. LYONS & CO. LTD., Cadby Hall, Kensington, London, W.14 ; Provisions, etc.	1937— No. 713	WELCH, MARGETSON & CO. LTD., 16, Moor Lane, London, E.C.3 ; Textiles, etc.
1937— No. 675	NESTLE'S MILK PRODUCTS LIMITED, 6 & 8, Eastcheap, London, E.C.3 ; Chocolate, Cocoa, Confectionery, etc.	1937— No. 714	W. G. WHITE & CO., 7, Love Lane, Wood Street, London, E.C.2 ; Clothing, etc.
1937— No. 676	NORTH BRITISH RAYON LIMITED, Clifford's Inn, London, E.C.4 ; Artificial Silk Yarn.	1937— No. 715	THE HORTON MANUFACTURING CO., LTD., Ebury Road, Rickmansworth ; Disinfectant, etc.
1937— No. 677	S. NOTON LIMITED, Endurance Works, Blackhorse Lane, Walthamstow, E.17 ; Fibreboard Cases, etc.	1937— No. 716	JOHN NOBLE LIMITED, Brook Street, Manchester ; Clothing, etc. <i>Applicable also to traffic consigned by one Associated or Subsidiary Company.</i>
1937— No. 678	PERGA LIMITED, 9/10, Bond Court, Walbrook, London, E.C.4 ; Waxed Paper Cartons, Tin Strips, etc. <i>Applicable to traffic consigned by one Associated or Subsidiary Company.</i>	1937— No. 717	EDWARD WEBB & SONS (STOURBRIDGE) LTD., Wordsley, Stourbridge, Worcs. ; Seeds, Packed Manure, etc.
1937— No. 679	ROMAC MOTOR ACCESSORIES LIMITED, Romac Works, The Hyde, Hendon, London, N.W.9 ; Motor Accessories, etc.	1937— No. 718	HIGHAM CAINE & CO. LTD. (HIGHOO STORES), Chorlton Street, Manchester ; Clothing, etc. <i>Applicable also to traffic consigned by one Associated or Subsidiary Company.</i>
		1937— No. 719	CARRONGROVE PAPER CO. LTD., Carrongrove Paper Mills, Denny, Stirlingshire ; Paper.

OFFICIAL NOTICES

The Bengal and North Western Railway Company Limited

THE Directors are prepared to receive Tenders for the supply of:—
400 SETS SCREW COUPLING BUFFERS
FOR WAGONS,
as per Specification to be seen at the Company's Offices.

Tenders addressed to the undersigned, and envelope marked "Tender for Buffers," with the name of the firm tendering, to be lodged not later than Noon on the 11th day of January, 1938.

For each Specification a fee of 10s. will be charged, which cannot, under any circumstances, be returned.

The Directors do not bind themselves to accept the lowest or any Tender.

By Order of the Board,
J. WILLIAMSON,

Managing Director.

237, Gresham House,
Old Broad Street,
London, E.C.2.
9th December, 1937.

THE MADRAS & SOUTHERN MAHRATTA RAILWAY COMPANY LIMITED invite Tenders for:—

19 LOCOMOTIVE ENGINES AND TENDERS—
BROAD GAUGE; 2-8-2 LIGHT GOODS
"XD" TYPE.

Specification and Form of Tender can be obtained at the Company's Offices, 123, Victoria Street, Westminster, London, S.W.1.

Fee ONE GUINEA, which will not be returned.

Tenders must be submitted not later than 3 o'clock p.m. on TUESDAY, 18th JANUARY, 1938.

The Directors do not bind themselves to accept the lowest or any Tender and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
G. W. V. DE RHE PHILIPPE,
Secretary.

Universal Directory of Railway Officials and Railway Year Book

43rd Annual Edition, 1937-38

This unique publication gives the names of all the principal railway officers throughout the world, together with essential particulars of the systems with which they are connected. Much general and statistical information about railways is also concisely presented.

Price 20/- net.

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33, Tothill Street, Westminster, S.W.1.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to:—The Railway Gazette, 33, Tothill Street, Westminster, London, S.W.1.

RAILWAY AND OTHER MEETINGS

Madras & Southern Mahratta Railway Co. Ltd.

The annual general meeting of the Madras & Southern Mahratta Railway Co. Ltd. was held at 123, Victoria Street, London, S.W.1, on December 15, Brig.-Gen. Sir Charles L. Magniac, C.M.G., C.B.E., Chairman of the company, presiding.

The Secretary (Mr. G. W. V. de Rhé Philipe, O.B.E.) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, said that the capital expenditure totalled Rs. 3.84 lakhs, or roughly £28,000, as compared with Rs. 21.33 lakhs in 1935-36. The major proportion was charged to rolling stock, namely, Rs. 3.43 lakhs, or about Rs. 1½ lakhs less than the amount under this head in the previous year. The sum debited to way and works was only Rs. 1.79 lakhs, which was about Rs. 8½ lakhs less than in the year 1935-36. The above were abnormally low figures, due to the fact that all the large capital works had been completed and no new constructions had been undertaken.

Gross earnings, totalling Rs. 747.37 lakhs, were Rs. 16.34 lakhs more than in the previous year. The whole increase was attributable to goods earnings. On the other hand, coaching receipts were some Rs. 7.77 lakhs less than in 1935-36. The company continued to suffer from the competition of road transport, both by coaches and lorries, although efforts to combat this competition in the shape of lower fares and parcel rates, diesel-electric rail-car services, reduced goods rates, and accelerated goods services had to a certain extent offset their losses. Until the vital question of the regulation of road transport had been settled by the Government in a way which would be fair to all transport undertakings, both rail and road, the difficulties of maintaining even the present level of earnings must continue to occupy the anxious attention of the administration.

Working expenses were Rs. 1.61 lakhs lower than in 1935-36, namely 449.86 lakhs. It was satisfactory that the percentage of working expenses to gross earnings had been reduced by 1.6 per cent. to 60.2 per cent. As to net earnings, the sum of £146,241 14s. 7d. received from India as surplus profits was some £27,000 more than the receipts for 1935-36. Payment of a final dividend on January 1 next of 4½ per cent., making 8½ per cent. for the year (compared with 8 per cent. the year before), would be made by withdrawing £50,000 from the dividend equalisation fund, which would then stand at £45,000.

The Agent painted rather a gloomy picture of prospects for the second half of the current year. He expected gross earnings would be adversely affected by the fall in the price of groundnuts, the increased production of cotton in America, and the loss of the Japanese market for this commodity, also to a small extent by the floods on the North-West and North-East Lines in November. Working expenses would inevitably show a marked increase. Also, in the last quarter of 1937, they had to allow for certain revenue expenditure, due to the handing over of the Mysore Railways to the Mysore Government and the termination of their existing contract. They might hope, however, that the surplus profits for the 9 months ending on December 31, 1937, would approximate to those of the corresponding period of 1936.

The new contract with the Secretary of State was finally executed on March 24, 1937, but would not come into force until January 1, 1938. The board had again felt the advisability of deputing one of its members to visit India this winter owing to the many important questions, decisions on which would be facilitated by discussion with the Railway Board and provincial authorities, and for this purpose the Deputy-Chairman, Colonel Bonham-

Carter, left England on November 19 last. He was expected to remain in India until about the middle of February next. The question as to whether their company came within the scope of the Industrial Profits Tax (National Defence Contribution) was under consideration by the Inland Revenue Authorities, and until a decision was made on this matter the company's liability could not be ascertained.

The report and accounts were unanimously adopted, after which the Chairman proposed: "That for the half-year ending December 31, 1937, a dividend of £2 15s. per cent., in addition to the guaranteed interest of £1 15s. per cent. to be received from the Government, or £4 10s. per cent. in all, be paid on the company's capital stock on January 1 next to all ordinary stockholders on the register on December 15."

This resolution was carried unanimously.

FOREIGN RAILWAYS INVESTMENT TRUST LIMITED.—At the ninth annual general meeting of this company on November 22, Viscount St. Davids said that the cause of the great fall in the securities held was the Argentine exchange. During the last six years the four main Argentine railways in which the company was so largely interested, had a loss on exchange between them of £18,553,000, or an average of £3,092,000 a year.

ANOTHER ACCIDENT IN SPAIN.—After the serious accident at Valencia on December 4, reported in these columns last week, a second disaster is recorded. This occurred between Vinaroz and Tortosa, near the Galera viaduct, where the Valencia mail train ran into a wagon which had been blown by the wind out of a wayside station. The mail train was derailed and two of the passenger coaches rolled down an embankment. Eleven bodies were recovered and over 80 injured were brought to Tortosa.

Railway Share Market

Holiday influences have resulted in a reduction of business in the stock and share markets to very small proportions. On balance the general tendency has been for prices to move against holders, but the undertone appears to have been much steadier than might have been expected, bearing in mind the added uncertainty regarding international affairs shown at the beginning of the week.

On Wednesday a firmer tone developed in Home Railway securities in sympathy with the general tendency of markets, and some of the junior stocks improved fractionally—but the traffic figures, although not unsatisfactory, proved below market expectations. The disposition is to assume that between now and the announcement of the dividend decisions in February there may be considerable expansion of interest in Home Railway stocks, granted markets become reasonably active.

L.M.S.R. ordinary was rather more

active around 29½ following news of the past week's £69,000 traffic increase, but the 4 per cent. preference at 82 and the 4 per cent. 1923 preference at 70½ were out of favour. In respect of 1936 the 4 per cent. preference dividend was earned 1½ times and the 4 per cent. 1923 preference dividend about 1½ times. The market still remains hopeful that the payment on the ordinary may be raised to 2 per cent. for 1937. Great Western ordinary stock was somewhat more active, at 62½ partly because of attention drawn to the attractive potential yields, assuming current estimates of a 4 per cent. dividend are realised. The £20,000 gain in the past week's traffic was up to best anticipations. L.N.E.R. second preference was lower on balance at 25½ and fractional declines were also made by the preferred and deferred stocks. Nevertheless, dividend prospects of the second preference shares continue to be viewed as encouraging in the market. The

£40,000 rise in receipts shown by the past week's traffic return was, however, below anticipations. The first preference was steady at 67. Southern deferred was maintained at 19, but the preferred was dull at 86½, sentiment being influenced to some extent by the traffic figures, which give an increase of only £3,000 for the past week. London Transport "C" went back to 79½ but later improved to 80.

Argentine Railway stocks were more active at the beginning of the week on hopes that the Argentine Government may shortly grant the request for increased transport rates. This is, however, not generally expected until early in the new year. B.A. Gt. Southern and Central Argentine preference stocks remained steady. Elsewhere a point of interest was moderate improvement in San Paulo, Nitrate Rails and Antofagasta were lower. Small fluctuations were shown by Canadian Pacific.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1936-37	Week Ending	Traffics for Week			No. of Weeks	Aggregate Traffics to Date			Shares or Stock	Prices				
			Total this year	Inc. or Dec. compared with 1936	Totals		Increase or Decrease	Highest 1936	Lowest 1936		Dec. 15, 1937	Yield % (See Note)			
													This Year	Last Year	
			£	£		£	£								
Antofagasta (Chili) & Bolivia	834	12.12.37	14,890	930	50	833,340	700,030	+	133,310	Ord. Stk.	25	151½	14	Nil	
Argentine North Eastern	753	11.12.37	8,530	439	24	231,870	224,075	+	7,795		12	2	6	Nil	
Argentine Transandine										A. Deb.	54	45	80½	5	
Bolivar	174	Nov., 1937	2,600	2,400	48	55,650	68,600	—	12,950	6 p.c. Deb.	9	5	81½	Nil	
Brazil										Bonds	16	11½	7	45½	
Buenos Ayres & Pacific	2,806	11.12.37	78,164	9,508	24	1,877,483	1,825,601	+	51,882	Ord. Stk.	171½	6	7	Nil	
Buenos Ayres Central	190	13.11.37	\$100,300	\$54,200	20	\$2,774,800	\$2,775,306	—	\$500	Mt. Deb.	31½	11	22½	Nil	
Buenos Ayres Gt. Southern	5,084	11.12.37	139,330	10,006	24	2,946,464	2,716,520	+	229,944	Ord. Stk.	315½	13½	19	Nil	
Buenos Ayres Western	1,930	11.12.37	46,526	1,822	24	1,088,152	982,759	+	95,393	"	293½	11	14½	Nil	
Central Argentine	3,700	11.12.37	124,302	23,752	24	3,022,317	3,308,337	—	286,020	"	329½	85½	15	Nil	
Do										Def.	21	4½	7	Nil	
Cent. Uruguay of M. Video	980	4.12.37	20,679	152	23	374,745	375,743	—	998	Ord. Stk.	75½	3	3	Nil	
Cordoba Central	1,218	11.12.37	24,880	7,970	24	749,780	776,040	—	26,260	Ord. Inc.	5	1	2½	Nil	
Costa Rica	188	Oct., 1937	22,580	3,354	18	101,026	71,989	+	29,037	Stk.	36½	32	28½	7	
Dorada	70	Nov., 1937	15,800	1,000	48	170,100	156,500	+	13,600	1 Mt. Db.	107	101½	107½	59½	
Entre Rios	810	11.12.37	13,288	1,564	24	320,400	304,819	+	15,581	Ord. Stk.	17	6	7½	Nil	
Great Western of Brazil	1,092	11.12.37	12,500	500	50	403,500	403,900	—	400	Ord. Sh.	12	5½	8	Nil	
International of C. Amer.	794	Oct., 1937	\$443,577	\$149,452	44	\$4,870,123	\$4,223,770	+	\$646,353						
Interoceanic of Mexico										Ist Pref.	12	—	—	—	
La Guaira & Caracas	224	Nov., 1937	4,865	240	48	56,685	50,475	+	6,216	Stk.	9	3	3½	Nil	
Leopoldina	1,918	11.12.37	20,838	393	50	1,150,542	983,599	+	166,943	Ord. Stk.	101½	31½	31½	Nil	
Mexican	483	7.12.37	\$274,400	\$26,800	23	\$6,688,500	\$6,112,500	+	\$576,000	"	114	14	12	Nil	
Midland of Uruguay	319	Oct., 1937	8,915	76	18	32,602	32,299	+	303	"	11½	10	12	Nil	
Nitrate	384	30.11.37	3,851	2,212	48	139,513	109,544	+	29,969	Ord. Sh.	63½	41½	25½	Nil	
Paraguay Central	274	11.12.37	\$4,393,000	\$1,016,000	24	\$78,301,000	\$69,913,000	+	\$17,391,000	Pr. Li. Stk.	85	71	77½	7½	
Peruvian Corporation	1,059	Nov., 1937	79,177	8,955	22	427,128	409,273	+	17,855	Pref.	15	9	5	Nil	
Salvador	100	4.12.37	\$25,250	\$5,250	23	\$296,845	\$272,308	+	\$24,537	Pr. Li. Db.	18	16	22½	8	
San Paulo	153½	5.12.37	31,955	1,054	49	1,391,406	1,443,832	+	147,574	Ord. Stk.	86	46½	62½	8	
Taitai	160	Nov., 1937	3,465	925	22	16,350	16,810	—	469	Ord. Sh.	115½	14½	34	135½	
United of Havana	1,353	11.12.37	14,728	3,276	24	390,523	369,738	+	20,785	Ord. Stk.	31½	1	2	Nil	
Uruguay Northern	73	Oct., 1937	979	192	18	3,384	3,771	—	387	Deb. Stk.	5	3	3½	Nil	
Canadian National	23,767	7.12.37	751,497	26,890	49	37,186,933	34,601,860	+	2,585,073						
Canadian Northern								—	4 p.c.	Perp. Dbs.	76	51	61½	65½	
Grand Trunk									4 p.c. Gar.	104½	99½	99½	4	Nil	
Canadian Pacific	17,228	7.12.37	571,200	10,000	49	27,136,000	25,823,200	+	1,312,800	Ord. Stk.	163½	101½	8	Nil	
Assam Bengal	1,329	10.11.37	43,267	659	30	827,867	781,774	+	46,093	Ord. Stk.	87½	82½	78½	31½	
Barsi Light	202	20.11.37	8,205	5,775	32	81,517	70,575	+	13,942	Ord. Sh.	77½	65½	53	97½	
Bengal & North Western	2,107	30.11.37	79,330	4,157	10	441,224	445,819	—	4,585	Ord. Stk.	319	292½	308	51½	
Bengal Doonars & Extension	161	20.11.37	5,546	1,575	32	96,293	86,073	+	10,220	"	127½	118	7	86½	
Bengal-Nagpur	3,268	30.11.37	191,250	16,114	34	4,540,298	4,003,956	+	536,342	"	104	100½	91½	47½	
Bombay, Baroda & C. India	3,072	10.12.37	243,225	34,275	36	6,007,125	5,685,825	+	321,300	"	114	110½	111½	5½	
Madras & Southern Mahratta	3,229	10.11.37	128,325	2,531	30	3,315,735	3,267,066	+	48,669	"	116½	108½	106½	8	
Rohilkund & Kumaon	572	30.11.37	12,935	896	10	70,284	74,698	—	4,414	"	311	286	303	51½	
South Indian	2,531½	10.11.37	98,664	2,868	30	2,574,073	2,478,580	+	95,493	"	107½	102½	100½	4½	
Beira-Umtali	204	Sept., 1937	98,053	13,994	52	975,721	803,277	+	172,444						
Egyptian Delta	620	20.11.37	8,211	1,463	32	168,065	158,078	+	9,987	Prf. Sh.	21½	15½	11½	Nil	
Great Southern of Spain										Inc. Deb.	11½	18	3½	—	
Kenya & Uganda	1,625	Oct., 1937	189,128	6,241	44	2,303,239	2,131,029	+	172,219						
Manila										B. Deb.	50½	37	45½	85½	
Midland of W. Australia	277	Oct., 1937	16,749	471	18	54,675	54,054	+	621	Inc. Deb.	97	93½	95	45½	
Nigerian	1,900	6.11.37	61,552	12,475	32	1,484,021	1,088,285	+	395,736						
Rhodesia	2,451	Sept., 1937	432,312	96,504	52	4,635,398	3,543,364	+	1,092,034						
South Africa	13,263	20.11.37	67,987	56,329	34	21,640,132	20,310,787	+	1,329,345						
Victoria	4,774	June, 1937	793,223	89,530	52	10,135,291	9,689,925	+	445,366						
Zafra & Huelva	112	Sept., 1937	15,307	8,641	39	117,046	65,948	+	51,098						

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1½.

* Receipts are calculated @ 1s. 6d. to the rupee. † ex dividend. Salvador and Paraguay Central receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements are based on the current rates of exchange and not on the par value.